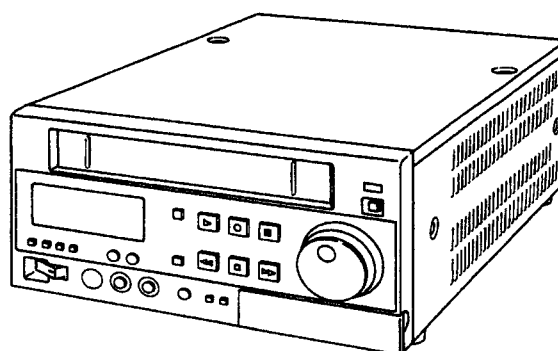


Service Manual

Panasonic **SVHS** VHS 625 **Hi-Fi** PAL

Video Cassette Recorder AG-MD830E

Sec. 1	Operating Instructions
Sec. 2	Disassembly Procedures
Sec. 3	Mechanism
Sec. 4	Electrical Adjustments
Sec. 5	Block Diagrams
Sec. 6	Schematic Diagrams
Sec. 7	Circuit Board Diagrams
Sec. 8	Exploded Views & Replacement Parts Lists



SPECIFICATIONS

ITEM			SPECIFICATION			ITEM			SPECIFICATION		
Power	Source	AC 120V ~ 240V± 10%, 50-60Hz		Audio	Heads	Normal Audio Control; 1 stationary head 2 ch Hi-Fi Audio; 2 rotary head Erase; 1 full track erase, 1 Audio track erase					
	Consumption	Approx. 35Watts				Tracks	Normal audio; 2 track (stereo) Hi-Fi Audio; 2 channels (stereo)				
Television Format	CCIR Standard(625 lines, 50fields) PAL color signal				Input		LINE (PHONO) × 2; - 8dB, 47kΩ unbalanced MIC (3.5mm PHONE); - 50dBv, 4.7kΩ unbalanced				
Tape Speed	23.39mm/ s					Output	LINE (PHONO) × 2; - 8dB, 600Ω unbalanced HEADPHONES (PHONE) - 60dBv to - 20dBv, 8Ω unbalanced MONITOR(PHONO) - 8dBv, 600Ω unbalanced				
Tape Format	S-VHS, VHS				Frequency Response		Normal; 50Hz to 10kHz Hi-Fi; 20Hz to 20kHz				
FF/REW Time	Approx. 2.5min. (with 180min. tape)					Dynamic Range	Hi-Fi; more than 90 dB				
Operating Condition	Temperature	5°C - 40°C (41°F to 104°F)			Signal-to-Noise Ratio		Normal; better than 42dB				
	Humidity	35% - 80%				Dimensions	10 - 5/8" (W) × 5 - 3/16" (H) × 14 - 3/8" (D) 270 (W) × 131.5 (H) × 365.5 (D) mm				
Weight	7.0kg				Standard Accessories		Power Cable				
Video	Heads	4 heads (NOR (49 μ m) × 2, SS (35 μ m) × 2) 1 flying (rotary) erase head (97 μ m)				Optional Accessories	RS-232C Serial Interface AG-IA823 34-pin Interface AG-IA34 Remote Controller AG-A600 Pause Remote Controller VW-RM1				
	Luminance	FM azimuth recording									
	Color signal	Converted subcarrier phase shift recording									
	Input	LINE (BNC); 1.0Vp-p, 75Ω unbalanced S-VIDEO (4P); Y: 1.0Vp-p, 75Ω unbalanced C: 0.3Vp-p (burst), 75Ω unbalanced									
		Output	LINE (BNC); 1.0Vp-p, 75Ω unbalanced S-VIDEO (4P); Y: 1.0Vp-p, 75Ω unbalanced C: 0.3Vp-p (burst), 75Ω unbalanced								
	Signal-to-Noise Ratio		VHS; Color; 46dB B/W; 47dB								
	Horizontal Resolution	S-VHS; 400 lines VHS; 240 lines									

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

INTRODUCTION

This Service Manual contains all the technical information which will allow service personnel to understand and service the Panasonic S-VHS video cassette recorder model AG-MD 830E. This model is developed for applications in industry and medical establishments and in addition, it has an optional accessory RS-232C Interface is a capable of satellite communication.

By the use of S-VHS system, a sharp picture quality with high resolution is obtained, and advanced editing by easy operation is realized by the introduction of highly dependable mechanisms.

Just slightly ahead of our time... Panasonic

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SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwhead connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between $1\text{M}\Omega$ and $5.2\text{M}\Omega$.
When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

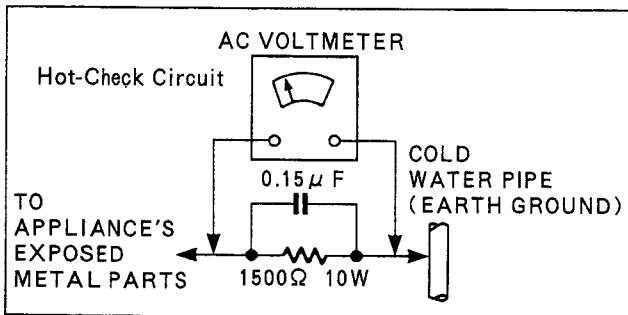


Figure 1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet.
Do not use an isolation transformer for this check.
2. Connect a $1.5\text{K}\Omega$, 10W resistor, in parallel with $0.15\mu\text{F}$ capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS . A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed $1/2$ milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

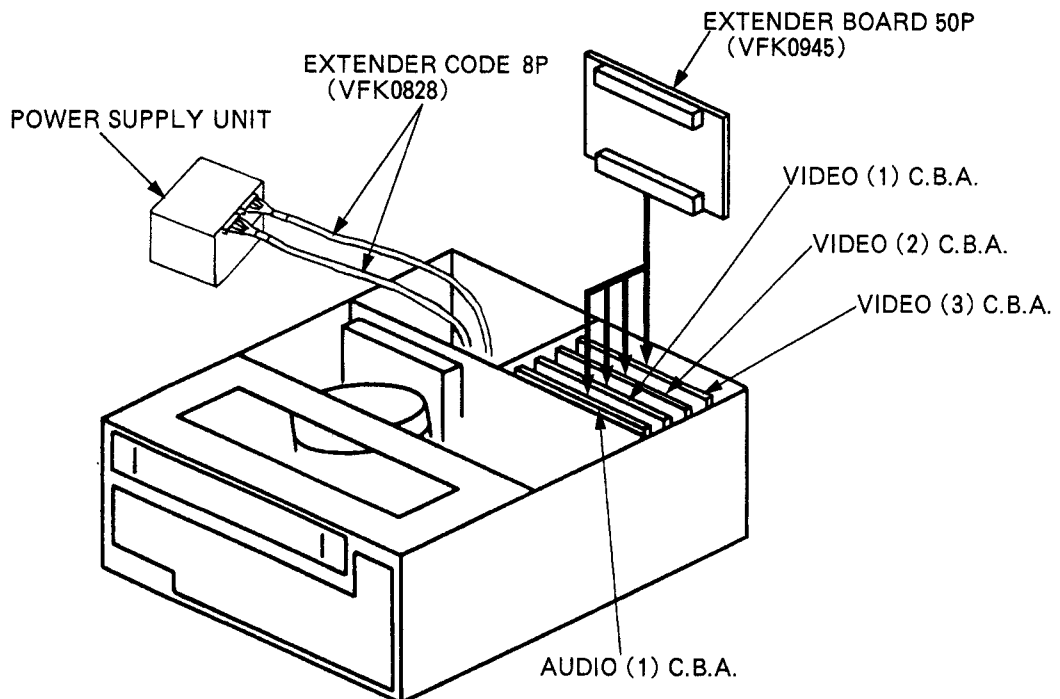
Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.
Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

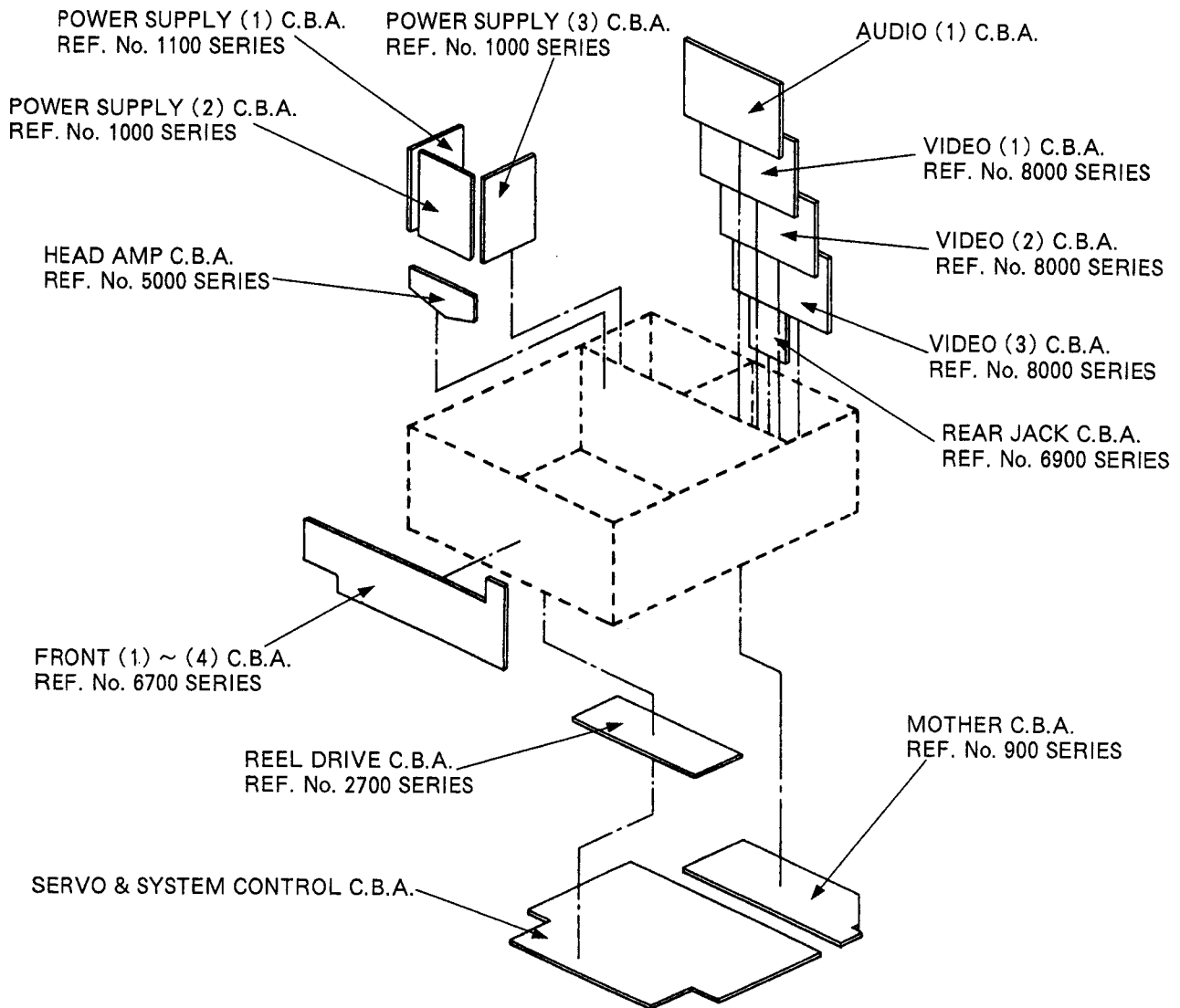
SERVICE INFORMATION

1. EXTENDERS

1. EXTENDER BOARD 50P (VFK0945) **NEW**
FOR AUDIO (1), VIDEO (1), (2) and (3) P.C. BOARDs
2. EXTENDER CODE 8P (VFK0828) SAME AS AG-6730 etc.
FOR POWER SUPPLY UNIT



2. CIRCUIT BOARD LAYOUT



SYSTEM CONTROL & SERVO C.B.A.

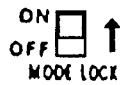
SYSTEM CONTROL SECTION: REF. No. 6000 SERIES
 SERVO SECTION: REF. No. 2000 SERIES
 CTL AMP SECTION: REF. No. 2300 SERIES
 REEL SERVO SECTION: REF. No. 2500 SERIES
 MOTER DRIVE SECTION: REF. No. 2300 SERIES
 DC-DC CONVERTOR SECTION: REF. No. 2900 SERIES

AUDIO (1) C.B.A.

NORMAL AUDIO SECTION: REF. No. 4000 SERIES
 Hi-Fi AUDIO SECTION: REF. No. 4000 SERIES

3. INITIALIZE (HOUR METER, MENU SETTINGS)

1. Turn off the Power.
2. Connect a jumper wire between TP8006 on the VIDEO (3) C.B.A. and TP1 on the VIDEO (1) C.B.A.
3. Set the MODE LOCK switch to ON.



<< HOUR METER RESET >>

Turn on the Power while the PLAY, REC and PAUSE buttons are depressed.

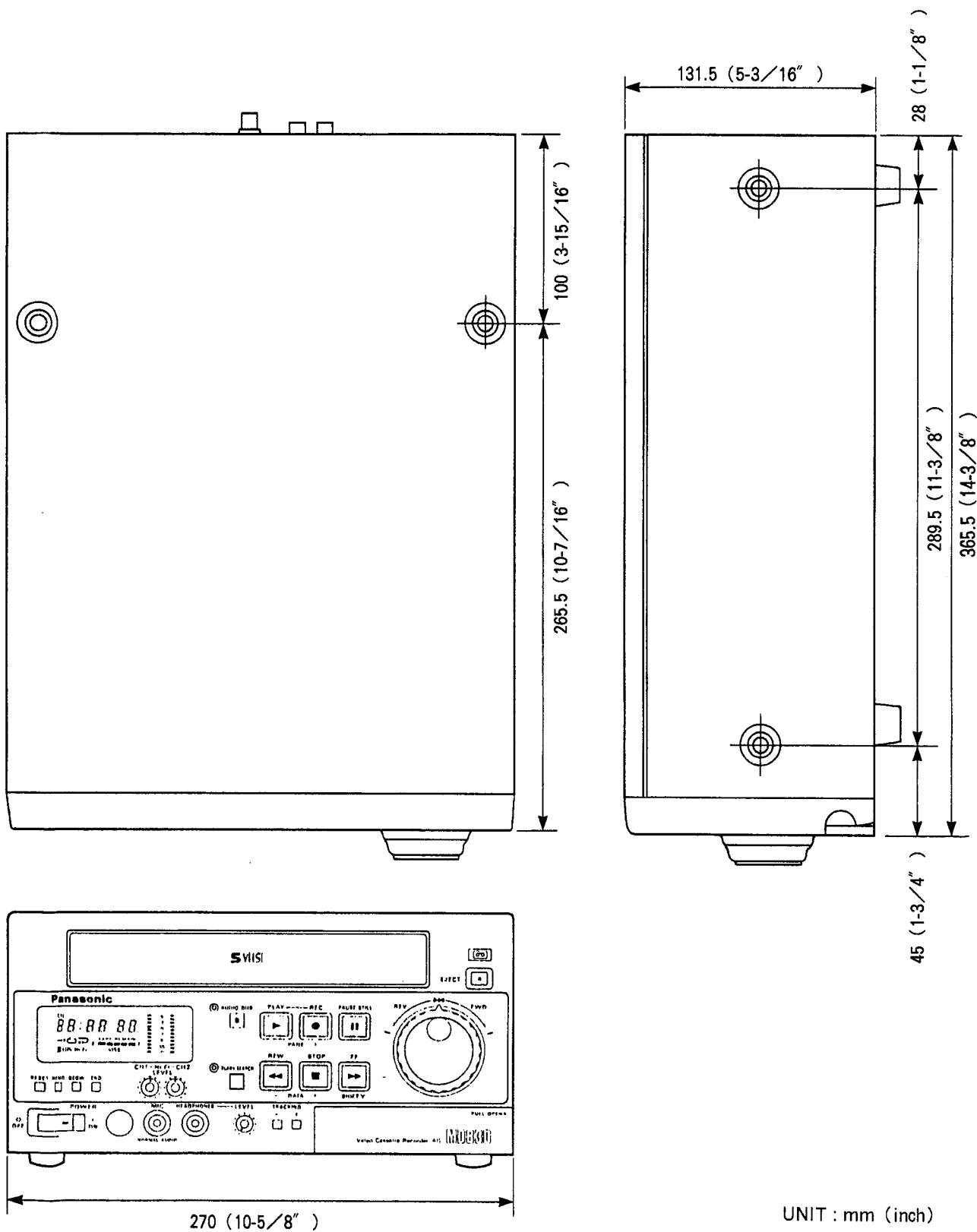


<< MENU SETTINGS RESET >>

Turn on the Power while the REW, STOP and FF buttons are depressed.



4. DIMENSIONS



SECTION 1

OPERATING INSTRUCTIONS

1

OPERATING INSTRUCTIONS

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Features

Rotary erase head

The rotary erase head is featured to ensure cleaner edits during editing.

Hi-Fi recording

High picture quality
Compactly designed for easy portability
Illuminated operation buttons

Repeat playback

A particular section on the tape can be continuously played back repeatedly or played back once.

Jog and shuttle functions

The unit's jog and shuttle functions enable playback section to be located speedily using the search dial.

Mode locking

Even when an operation button has been pressed in error, the mode lock function prevents the unit from performing the operation corresponding to that button.

Unrecorded blank search

The unit detects unrecorded blanks which are 5 or more seconds in length.

Automatic high-speed VISS search

By writing the VISS (VHS Index Search System) signals at particular scenes to be viewed, the scenes can be easily located and played back automatically.

Audio dubbing

Audio can be added to the normal audio track during post production editing.

Switch settings on screen menus

The unit's on-screen system enables switch settings to be viewed on the TV screen.

Auto head cleaning

This facility automatically cleans the video heads to remove any dirt.

Pause remote control supported

Recording can be started and stopped by remote control using the VW-RM1 which is available as an optional accessory.

RS-232C serial interface supported

The unit can be remote-controlled from a personal computer by mounting the AG-IA823 interface which is available as an optional accessory.

34-pin remote control supported

The unit can be operated from a distance of 5 meters or so using the AG-A600 (an optional accessory) by installing the AG-IA34 interface which is available as an optional accessory.

Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

This product is equipped with 2 types of AC mains cable. One is for continental Europe, etc. and the other one is only for U.K.

Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

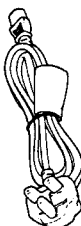
FOR CONTINENTAL EUROPE, ETC.

Not to be used in the U.K.



FOR U.K. ONLY



If the plug supplied is not suitable for your socket outlet, it should be cut off and appropriate one fitted.



FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 13 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 13 amps and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced. If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

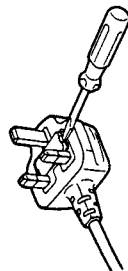
WARNING: THIS APPLIANCE MUST BE EARTHED.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

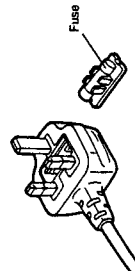
Green-and-Yellow: Earth
Blue: Neutral
Brown: Live

How to replace the fuse

1. Open the fuse compartment with a screwdriver.

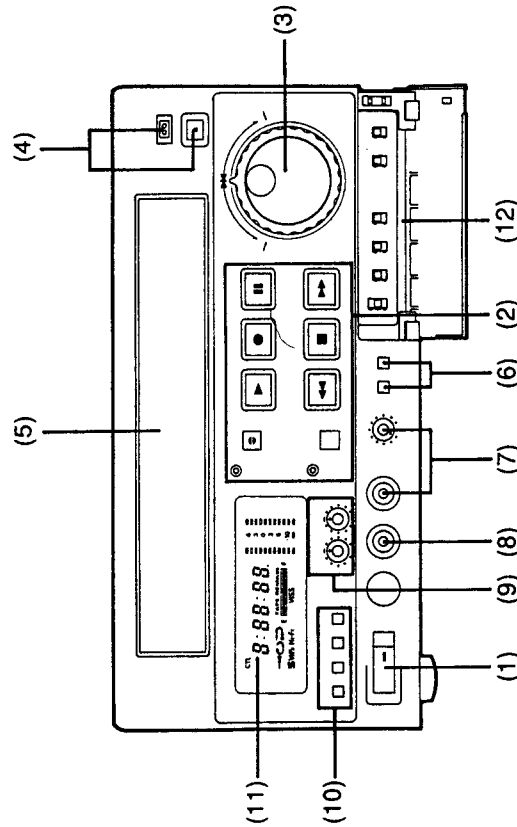


2. Replace the fuse.

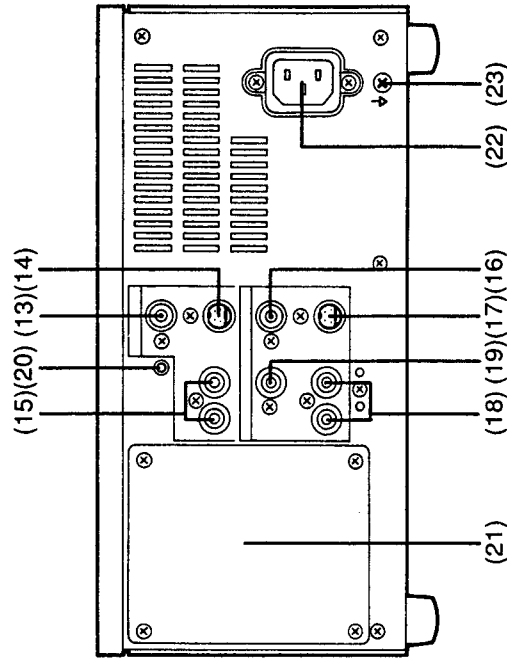


Controls

Front Panel

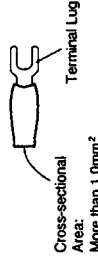


Rear Panel



No.	Name	Page	No.	Name	Page
1	Power switch	—	8	Microphone jack (mini jack)	E-14
2	Operation buttons STOP, PLAY, REC, REV, FF, PAUSE/STILL, AUDIO DUB, BLANK SEARCH	E-11 – E-17	9	Hi-Fi audio level control CH1/CH2	E-14
3	Search dial	E-16	10	Counter setting buttons	E-11
4	Eject button/tape indicator	—	11	Counter/audio level meter	E-11
5	Cassette holder	—		Setting switch section	E-15
6	Tracking buttons	E-16		AUDIO OUT selector	E-14
7	Headphones jack (mini jack)/ Headphone level control	E-14	12	METER/AUDIO OUT switch (H-FINORMAL)	E-14
				VIDEO INPUT selector (S-VIDEO LINE)	E-14
				S-VHS REC MODE selector (AUTO/OFF)	E-14
				MENU screen selector (SET/OFF)	E-8
				MODE LOCK switch (ON/OFF)	E-15

No.	Name	Page	No.	Name	Page
13	VIDEO input connector (BNC)	E-14	23	Equipotential terminal	—
14	S-VIDEO input connector (4P)	E-14		When connecting this unit to any other component, make absolutely sure that it is properly grounded by connecting this terminal.	
15	AUDIO CH1/CH2 input connectors (PHONO)	E-14		When connecting, use the terminal lug, and be sure to used wire with a cross-sectional area of at least 1.0 mm ² .	
16	VIDEO output connector (BNC)	E-15			
17	S-VIDEO output connector (4P) (PHONO)	E-15			
18	AUDIO CH1/CH2 output connectors	E-15			
19	AUDIO MONITOR output connector	—			
20	PAUSE REMOTE connector	E-18			
21	Blank panel or RS-232C/34-pin options	E-18			
22	Power socket	—			



Menu Screens

The menu settings can be performed while monitoring the TV screen or the level meter.

Setting up your VTR for proper operation.

When you receive your VTR, it will be set up as follows:

COUNTER INDICATOR	VIDEO MONITOR	DEFAULTS
1001:00	VISS	OFF
1002:00	TAPE SELECT	--E180
1003:01	AUTO BACK	ON
1004:00	TAPE IN MODE	STOP
1005:01	TAPE END MODE	REW
1006:00	REC TAPE END	STOP
1007:01	STBY OFF TIME	5 MIN

MENU B

COUNTER INDICATOR	VIDEO MONITOR	DEFAULTS
1008:01	HI-FI REC	ON
1009:00	AUDIO DUB	CH1:CH2
1010:00	EDIT	OFF
1011:00	NOTCH	OFF

If optional AG-1A823 serial interface board is installed:

MENU C

COUNTER INDICATOR	VIDEO MONITOR	DEFAULTS
3001:01	BIT LENGTH	8 BIT
3002:00	STOP BIT	STOP-1
3003:02	PARITY	NONE
3004:03	BAUD RATE	9600

To reset any of these defaults:

- Press the STOP Button to place the VTR into the stop mode.
- Set the MENU Switch to the SET position (switch is located under door on front panel).
NOTE: When in the menu set position PLAY, REC, FAST FORWARD and REW will not function.
- You can change these settings either by watching the counter indicator on the VTR or by watching the video monitor.
- To change the individual default settings use the PLAY or REC buttons to select the different menu pages, which will display the different settings.
- To select the individual settings either use the FF button or the inside search dial control. A flashing bar will highlight your selection if you are viewing your video monitor. If you use the counter indicator to make these changes, the first four digits select the item you would like to change and the last two select the default setting (on/off, etc.).
The counter display codes are on page E-9.
- To change the default setting use either the STOP or REW buttons.
- After making the necessary changes, make sure to reset the MENU set switch to OFF.

Menu Item Settings

Counter Indicator No. (*)	Superimposed monitor	Setting (underlining denotes default setting)	Description of function
1001	VISS	00 : OFF 01 : REC 02 : REC/PAUSE	VISS signal recording and counter memory operation OFF: The VISS signal is not recorded (neither is the memory operation based on the VISS signal performed). REC: The VISS signal is recorded by pressing the REC and PLAY buttons together during recording. REC/PAUSE: The VISS signal is recorded when the recording or recording pause mode is released. "VISS" appears on the display tube when REC or REC/PAUSE is selected.
1002	TAPE SELECT	00 : --E180 01 : E240--	--E180: When a tape with a length of 180 minutes or less is used. E240--: When a tape with a length of 240 minutes or more is used.
1003	AUTO BACK	00 : OFF 01 : ON	Auto back space recording function setting in recording. ON: The tape is rewound for approximately one second when the REC Button is pressed in the PLAY/STILL mode or the PAUSE/STILL Button is pressed during recording. When the PAUSE/STILL Button is pressed again, the tape plays back for one second and then recording starts.) OFF: Normal REC/PAUSE operation
1004	TAPE IN MODE	00 : STOP 01 : REW	STOP: The unit is placed in the stop mode after the tape has been loaded. REW: The tape is rewound to its beginning, and then it stops.
1005	TAPE END MODE	00 : STOP 01 : REW	STOP: The tape stops when it comes to the end. REW: The tape is rewound to its beginning, and then it stops.
1006	REC TAPE END	00 : STOP 01 : EJECT	STOP: The tape stops when it comes to the end. EJECT: The tape is ejected when it comes to the end.
1007	STBY OFF TIME	00 : 0 MIN 01 : 5 MIN 02 : (30 MIN)	Standby release time 0 MIN: With full loading STOP, the tape cylinder stops immediately. 5 MIN: The tape cylinder stops after REC/PAUSE continued for 5 minutes or longer. 30 MIN: The tape cylinder stops after REC/PAUSE continued for 30 minutes or longer. (Every 5 minutes, however, the tape is advanced in the forward direction by 3 frames.)

* This appears along with the figure representing the setting which is indicated on the counter section of the display tube.

Operation

Use the operation buttons and search dial as shown below.



This moves the selection item cursor forward.

00:OFF 00:OFF
01:REC 01:REC
02:REC/PAUSE 02:REC & PAUSE



This moves the selection item cursor backward.

00:OFF 00:OFF
01:REC 01:REC
02:REC/PAUSE 02:REC/PAUSE



This returns to the previous menu page.



This advances to the next menu page.



This moves the menu selection to the item below.

TAPE IN MODE 00:STOP
TAPE END MODE 00:STOP
↓
TAPE IN MODE 00:STOP
TAPE END MODE 00:STOP



This turns the inside search dial (jog function).

Instead of using , this can be used

to move the menu selection to the item above or below.

TAPE IN MODE 00:STOP
TAPE END MODE 00:STOP
↑
TAPE IN MODE 00:STOP
TAPE END MODE 00:STOP

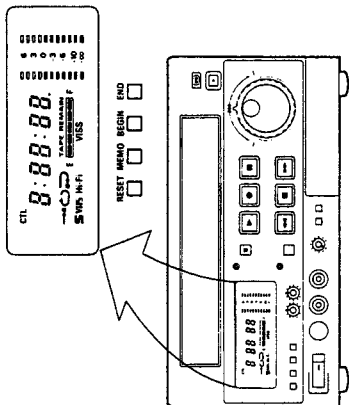
Counter Section

Counter indicator No.	Superimposed monitor	Setting (underlining denotes default setting)	Description of function
1008	HI-FI REC	00 : OFF 01 : ON	Hi-Fi audio recording (Cannot be used for audio DUB) OFF: Hi-Fi audio is not recorded. ON: Hi-Fi audio is recorded.
1009	AUDIO DUB	00 : CH1,CH2 01 : CH1 02 : CH2	Selection of channel track for audio dubbing CH1,CH2 : The sound is added to CH1 and CH2 simultaneously. CH1: The sound is added to CH1. CH2: The sound is added to CH2.
1010	EDIT See Note 1	00 : OFF (regular operation) 01 : ON (editing/dubbing)	Editing/regular operation selection OFF: Regular operation ON: For editing or dubbing
1011	NOTCH See Note 2	00 : OFF 01 : ON	For setting the NOTCH ON or OFF OFF: NOTCH OFF ON: NOTCH ON

The items shown below are displayed when the AG-1A823 serial interface board is used.

Counter indicator No.	Superimposed monitor	Setting (underlining denotes default setting)	Description of function
3001	BIT LENGTH	00 : 7BIT 01 : 8BIT	Character length setting 7BIT: 7 bits 8BIT: 8 bits
3002	STOP BIT	00 : STOP-1 01 : STOP-2	Stop bit setting STOP-1: 1 bit STOP-2: 2 bits
3003	PARITY	00 : ODD 01 : EVEN 02 : NONE	Parity bit setting ODD: Odd EVEN: Even NONE: None
3004	BAUD RATE	00 : 1200 01 : 2400 02 : 4800 03 : 9600	Baud rate setting 1200: 1200 bps 2400: 2400 bps 4800: 4800 bps 9600: 9600 bps

Notes:
1. Edit function: When this is set ON, the noise reduction circuit for the video signals is set OFF. (The video noise will increase slightly. For regular use, EDIT OFF recommended.)
2. NOTCH: When there is high level of noise in the luminance signals, it may also affect the chrominance signals. In a case like this, set the NOTCH to ON. Since the luminance signal band is reduced slightly when the filter is set to ON, the NOTCH OFF position is recommended for regular use.



Each time the MEMORY Button is pressed, the mode changes in the following sequence:

- Memory stop
- 1-time memory repeat
- Continuous repeat
- No indication (OFF)

"VISS"

- This blinks while the VISS signal is being written on the tape.
- It lights when VISS is set on the menu.

Counter Reset

The counter display is reset to "0:00:00" when the RESET Button is pressed. The BGVEND setting is also set to "0:00:00".



Remaining Tape

"TAPE REMAIN" provides a rough indication of the amount of tape remaining. The indication appears about 40 seconds after recording or playback has commenced (it does not appear until this time).



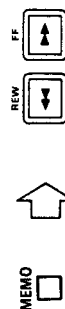
Each lamp going off one after another indicates that the tape is approaching its end.

Note: The remaining tape indicator provides only a rough indication: it is not meant to be precise.

Memory Stop

To use the AUTO MEMORY STOP function:

1. Press the MEMORY Button (MEMO). To turn on the MEMORY STOP function, the following symbol "→" will be indicated in the counter display.
2. When the VTR is placed in record a VISS signal will be placed on the video tape.
3. Now when the video tape is rewound or fast forwarded it will stop at the start of any recording.
4. This function can be turned off by pressing the MEMORY Button (MEMO).
5. Repeat playback is covered on page E-13.



Press this to turn on "MEMORY STOP."



The tape stops automatically at the VISS write point or BGN set point.

VISS Signal

After VISS has been set on the menu screen, the VISS signal is automatically written on the tape when recording is started.

It can also be written at the desired position on the tape by pressing the REC Button and PLAY Button simultaneously during recording.

- Locating particular scenes to be viewed becomes easy if VISS signals are written with each recording.
- "VISS" blinks on the counter section while the VISS signal is being written.

(1) Select 01 or 02 for VISS on the menu screen.

01: REC
02: REC/PAUSE

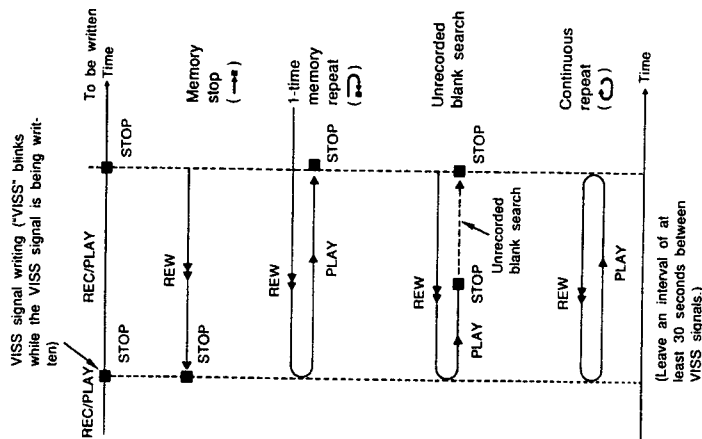
(2) Press the MEMORY Button to establish the memory mode. "VISS" now lights on the counter section.

Memory mode	Display	Function
MEMORY REPEAT		Playback is repeated at the VISS write point.
MEMORY 1 TIME REPEAT		Playback is repeated only once at the VISS write point.
MEMORY STOP		The tape stops at the VISS write point.

(3) Press the FF or REW Button.
When the VISS signal is located, the unit automatically operates in accordance with the memory mode.

- Leave an interval of at least 30 seconds on the tape for writing the VISS signal. (The signal will not be detected if the interval is less than 30 seconds long.)

VISS Setting



Repeat Playback

(1) Turn VISS function OFF:

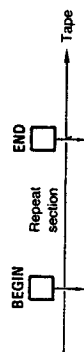
- Press the MEMORY (MEMO) Button and select continuous repeat playback (MEMORY REPEAT) or 1-time repeat playback (MEMORY 1 TIME REPEAT).

MEMO



Press this and turn on "C" or "1" :

- Press the BEGIN and END Buttons to set the tape beginning and ending positions for repeat playback.



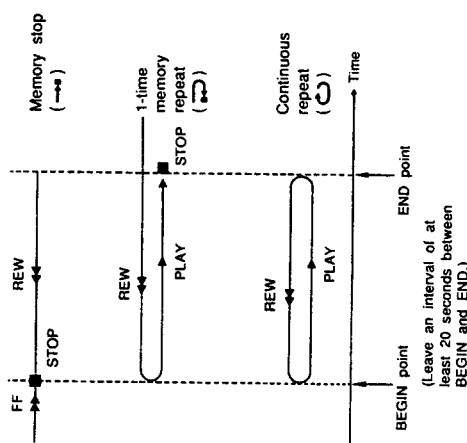
3) Press the FF or REW Button.

(2) While "VISS" is on the display tube:

The VISS signal is used for repeat playback. (Refer to the section on the VISS signal on page E-12.)

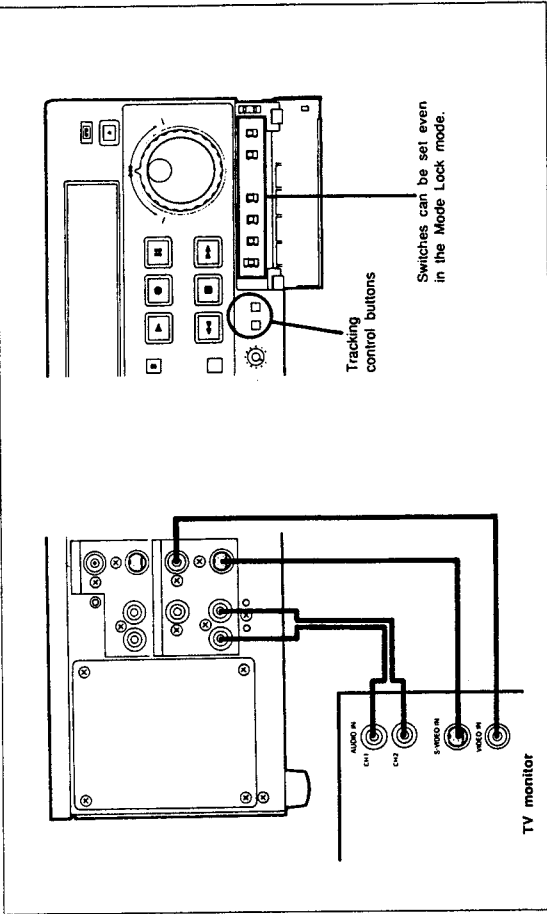
- When the beginning and ending positions are the same, the tape will be repeatedly played back between the beginning position and tape end.
- When the ending position comes after the actual tape end, the tape will be repeatedly played back between the beginning position and tape end.
- When the beginning position comes before the actual tape beginning, the tape will be repeatedly played back between the tape beginning and end position.
- The precision of repeat playback may be impaired when a short section (less than 20 seconds or so long) of the tape is to be repeatedly played back.

BEGIN/END settings (set VISS to OFF on the menu)



(Leave an interval of at least 20 seconds between BEGIN and END.)

Playback



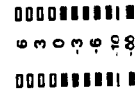
Preparations

- The REC Button will not operate if the accidental erasure prevention tab on the cassette tape has been broken out. Use a tape with this tab still intact.
- Proceed as follows when using the PAUSE Button.
- (1) While playing back the tape, find the location to be recorded. Then press the PAUSE Button.
The unit is now set to the playback pause mode.
 - (2) Press the REC Button.
The REC Lamp now comes on, and the unit is set to the recording pause mode.
 - (3) When the PAUSE Button is pressed again, the unit is released from the pause mode, and recording begins.

Audio Monitoring

The audio signals are selected by the AUDIO OUT Selector. When using headphones, the volume can be adjusted using the Headphone Level Control.

- To reduce the audio level, turn the control counter-clockwise; to increase the audio level, turn it clockwise.
- The audio level may change if high-impedance headphones are connected to the MIC jack.

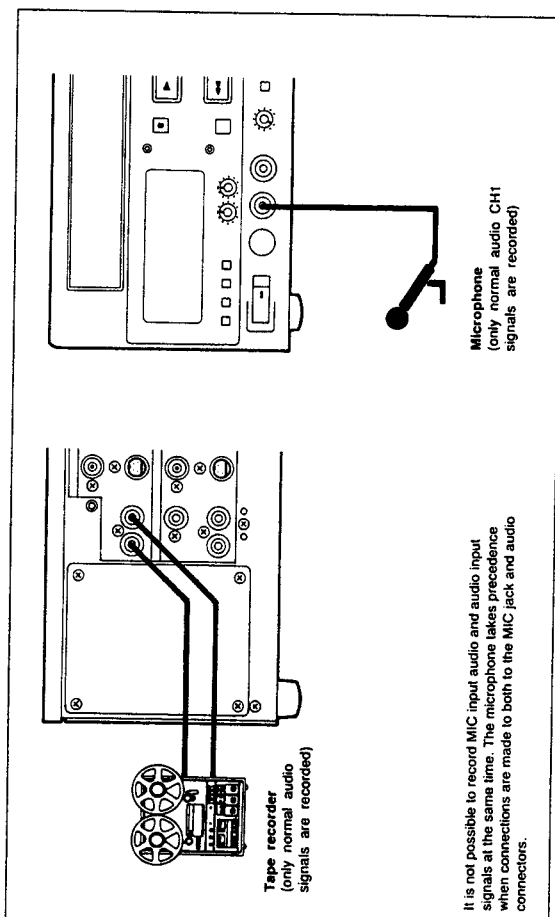


- E-15 -

OPERATING INSTRUCTIONS

Audio Dubbing

"Audio dubbing" is a function which is used to record sound onto an already recorded tape. Sound can be recorded onto normal audio track CH1 or CH2 or onto both the CH1 and CH2 channels. (It cannot be recorded onto the Hi-Fi audio tracks.)



It is not possible to record MIC input audio and audio input signals at the same time. The microphone takes precedence when connections are made to both to the MIC jack and audio connectors.

Preparations

- Load the pre-recorded cassette tape. (Check that the accidental erasure prevention tab on the tape is still intact. When it has been broken out, the AUDIO DUB Button will not function even if it is pressed.)
- Using AUDIO DUB on the menu screen, select the channels on which the sound is to be added (audio dubbing).

Operation

- (1) Press the PLAY Button to start playback.
- (2) Press the PAUSE/STILL Button where the sound is to be added (audio dubbing) to place the unit in the pause mode.
- (3) Press the AUDIO DUB Button.
- (4) Audio dubbing starts when the PAUSE/STILL Button is pressed to release the unit from the pause mode.
- (5) To stop the audio dubbing, press the STOP Button.

- When audio dubbing is performed, the previously recorded sound will be erased and the new sound will be recorded in its place.
- Bear in mind that howling may occur if audio dubbing is performed with the unit placed near a TV set.
- Audio dubbing cannot be performed when the tape's accidental erasure prevention tab has been broken out.

Still Playback and Slow-Motion Playback

The unit is placed in the still picture mode when the search dial is set to its centre click-stop position.

- When noise appears during still playback, proceed with the slow tracking adjustment.



Slow Tracking Adjustment

If noise should appear at the top or bottom of the picture during still playback or slow-motion playback (1/25 to 1/2x normal tape speed), press the Tracking "+", "-" or "0" Button to reduce the noise in the slow-motion playback mode.

- When still playback continues for more than 5 minutes, the unit will be placed automatically in the stop mode in order to protect the video heads.
- No sound is heard during still playback.
- During still playback a colour programme may appear in black or white or the playback image may darken: this is normal and not indicative of malfunctioning.

Field-by-Field Playback

Press the FF or REW Button during still playback. When the FF Button is pressed, the tape is fed by one field in the forward direction; when the REW Button is pressed, it is fed by one field in the reverse direction. When the FF or REW Button is kept depressed, the tape is played back in the forward or reverse direction at approximately 1/25th of the normal speed.

Unrecorded Blank Search

If a tape with unrecorded blanks lasting 5 or more seconds has been loaded, these blanks will be detected automatically.

- (1) Load the tape.
- (2) Press the BLANK SEARCH Button. The tape is searched automatically in the forward direction and is stopped automatically when an unrecorded blank lasting 5 or more seconds is detected.

Rewinding and Fast Forwarding

To rewind or fast forward the tape, press the REW Button or FF Button when the tape has stopped moving.

Search/Jog Playback

Search playback (outside ring)

The unit is placed in the search mode by turning the outside ring of the search dial.

A tape can be played back up to 11 times the normal speed.

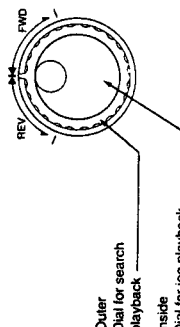
- In the search mode, the FF Lamp (forward direction) or REW Lamp (reverse direction) blinks.
- Set the search dial to its centre click-stop position for still playback.

To release the search mode, press the PLAY, STOP, STILL, FF or REW Button.

Jog playback (inside ring)

The unit is placed in the jog mode when the search dial is set to the search/pause (centre click-stop) position.

When the inside ring is now turned, the tape speed can be varied from -1x to +1x the normal tape speed. Still playback is established when the inside ring is no longer turned.



- A colour programme may appear in black and white during search or jog playback: this is normal and not indicative of malfunctioning.
- The playback pictures may appear distorted during search or jog playback: this is normal and not indicative of malfunctioning.
- No sound is heard during search or jog playback. Normal sound is heard at a tape speed of 1/2x or higher.

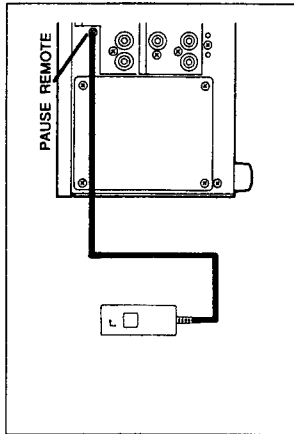
To Finish Playback

Press the STOP Button.

Remote Controllers

VW-RM1 pause remote controller (optional accessory)

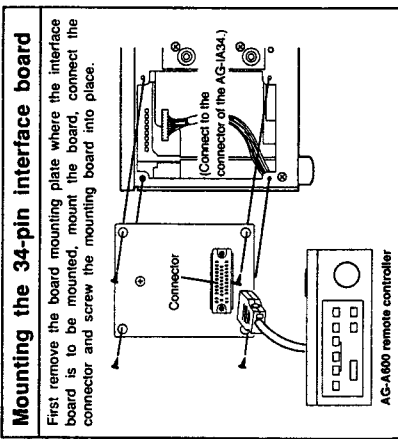
When the VW-RM1 pause remote controller is connected to this unit, recording can be set to the pause mode from a distance instead of using the button on the unit itself.



AG-A600 remote controller (optional accessory)

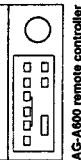
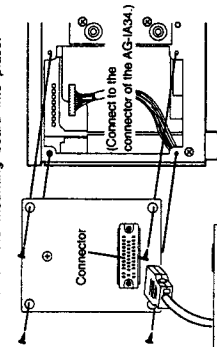
When the AG-IA34 34-pin interface board, available as an optional accessory, is mounted, the unit can be operated by remote control at a distance of about 5 meters instead of the unit's own operation buttons being operated.

- The speed of the playback pictures can be varied up to about 11 times the normal speed in the forward or reverse direction.



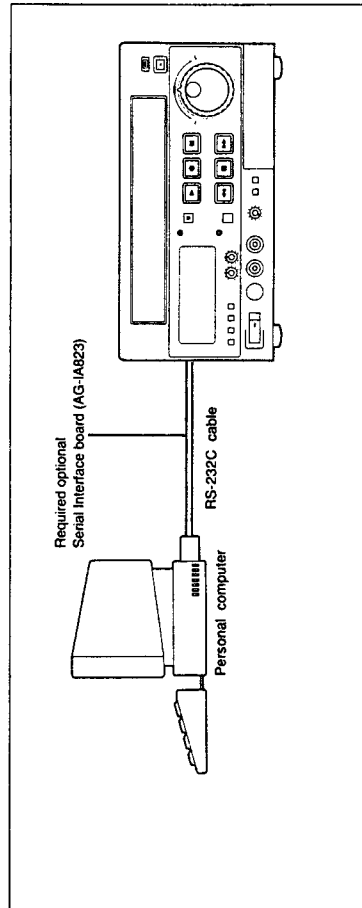
Mounting the 34-pin interface board

First remove the board mounting plate where the interface board is to be mounted, mount the board, connect the connector and screw the mounting board into place.



Computer Remote Control

Using the optional RS-232C serial interface board (AG-IA823) and RS-232C cable, as shown in the figure below, a personal computer can be used to operate the unit in various ways.



Cautions for Use

- Do not insert fingers or any other objects into the video cassette holder.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the unit and to the tape.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, turn the Power OFF and disconnect the power plug from the AC outlet.
- Do not leave a cassette in the unit when not in use.
- Do not block the ventilation slots on the sides of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Keep the VTR away from flower vases, tubs, sinks, etc.
- CAUTION: If liquids should be spilled into the VTR, serious damage could occur. If you spill any liquid into the VTR, remove power and consult qualified service personnel.
- Wipe the VTR with a clean, dry cloth. Never use cleaning fluids, chemicals or wax.
- Do not attempt to disassemble the unit. There are no user serviceable parts inside.
- If any liquid spills inside the unit, have the unit examined for possible damage.
- Refer any needed servicing to authorized service personnel.

Cleaning care for video heads

If the screen should appear as shown below, it means that the video heads are dirty. It is recommended that you clean the heads periodically. Use the optional cleaning tape and special purpose cleaning fluid to clean the heads. Consult with your dealer if the symptoms should persist even after cleaning.



Notes:

- We do not recommend that you attempt to clean the video heads yourself.
- Repeated head cleaning will shorten the service life of the video heads.
- Nothing can be recorded on the head cleaning tape.
- If you use cleaning fluid, wipe the cleaned heads with a dry cloth before using the unit.

Dew Indication

When dew is detected, the safety device of this unit will operate in order to protect the cassette tape and video heads.

In case of dew detection, the "d" mark in the counter lights. Wait until the "d" mark goes out with Power switch turned ON to operate the VTR.

"d" mark lights.



Note

Dew condensation normally occurs gradually. Therefore, there may be cases in which the "d" mark does not start flashing until 10 or 15 minutes after dew has begun to condense. In particular, if the temperature or humidity in the room change, wait about 20 minutes before using the unit.

Cause of Condensation

Condensation forms if warm air comes in contact with a cold object, for example on a window in a well-heated room in winter. It may form if the unit or the video cassette is exposed to sudden changes in temperature and humidity such as may occur when the unit or the video cassette is taken from a cold to a warm place. For instance:

- In a room where the heater has just been turned on in winter;
- In a room with steam or high humidity;
- If the unit or the cassette is brought from cold surroundings into a well-heated room.

Troubleshooting

Check out the points in the table given below, and consult with your dealer if the trouble should persist.

Trouble	Checkpoint/Remedial Action	Ref. Page
No power	<ul style="list-style-type: none"> Has the power cable been connected? 	-----
No operation even when an operation button is pressed	<ul style="list-style-type: none"> Is the power switch in the ON position? Has a cassette tape been loaded? Is "d" displayed indicating condensation lighted? Keep the power supplied to the unit and wait until the "d" in display goes off. Is the Mode Lock Switch at the OFF position? 	----- ----- E-19 E-15
No recording	<ul style="list-style-type: none"> Has the tape's accidental erasure prevention tab been broken out? Has the INPUT Selector been set to the proper position? 	----- E-14
Noise appears on playback pictures.	<ul style="list-style-type: none"> Press the Tracking Buttons and adjust. 	E-15, E-16
No repeat playback	<ul style="list-style-type: none"> Has the MEMORY (MEMO) Button been set to the proper position? Has the counter been reset? Is the VISS setting on the menu screen at OFF? Has an interval of at least 20 seconds been given between BEGIN and END? 	E-11 E-11 E-9 E-13
No VISS signal writing	<ul style="list-style-type: none"> Is the VISS setting on the menu screen at REC or REC/PAUSE? Has an interval of at least 30 seconds been given between one VISS and another VISS signal? 	E-9 E-12

Error Display

The following error messages will be displayed on the tape counter if an abnormality occurs in the unit. In this case, follow instructions described below.

■ When an error code appears:

- An error code appears on the display.
- All operations are shut down when an error code appears on the display.
- If the error is not released even after taking the remedial action described below, switch off the power, disconnect the power cable from the power outlet, and contact your dealer immediately.

■ List of error codes

Error Code	Malfunction	Remedial action
E-2	Malfunction in elevator section	These errors may occur if the video cassette has not been loaded properly. Try switching the power off and turning it back on again.
E-3	Malfunction in loading section	These errors may occur if there is something wrong with the state of the video cassette. Try switching the power off and turning it back on again and replacing the video cassette.
E-4	Malfunction in cylinder section	Try switching the power off and turning it back on again.
E-5	Malfunction in reel section	
E-6	Incorrect tape tension	
E-7	Malfunction in solenoid	

SECTION 2

DISASSEMBLY PROCEDURES

2

DISASSEMBLY

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2-1 DISASSEMBLY FLOW CHART

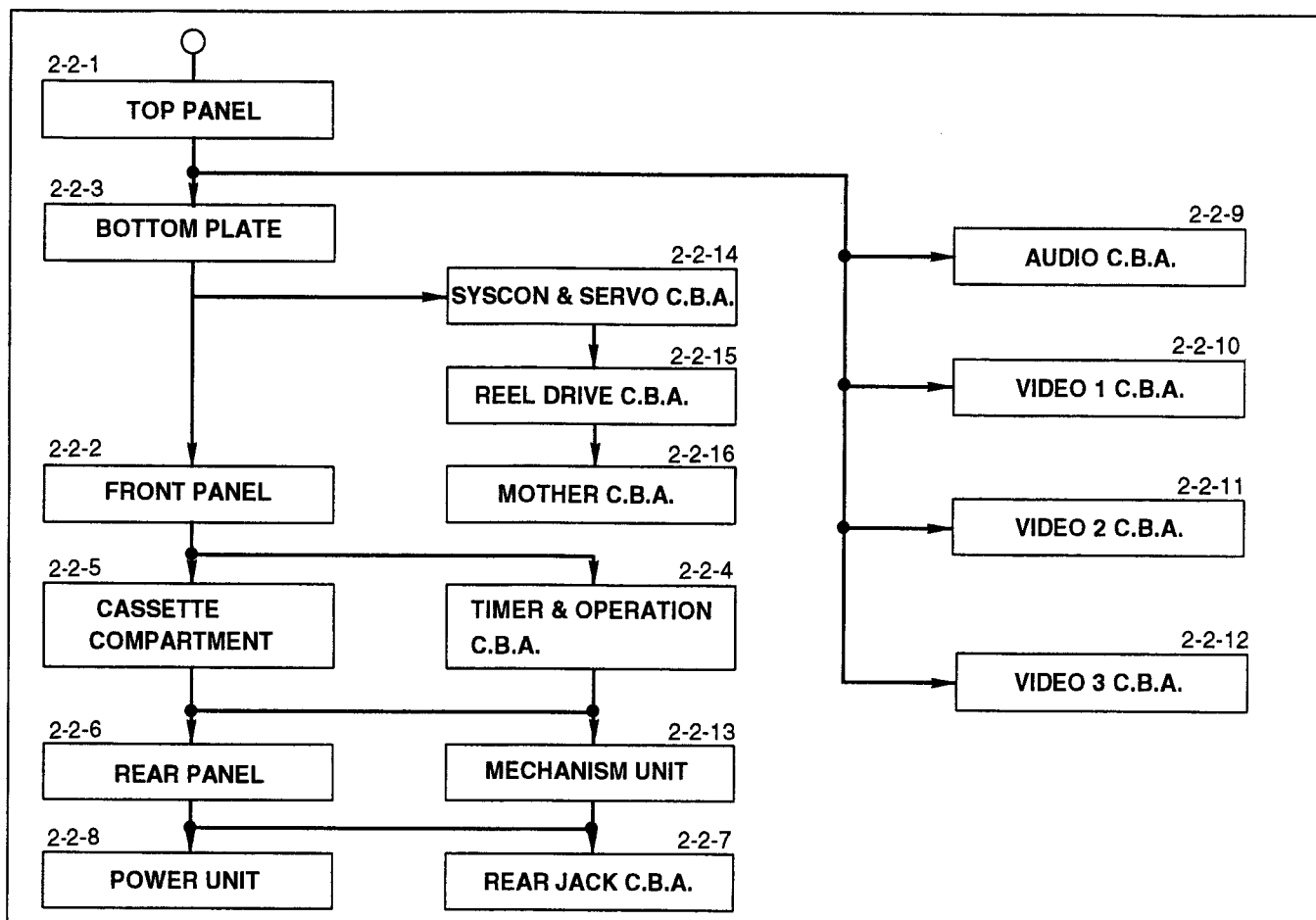


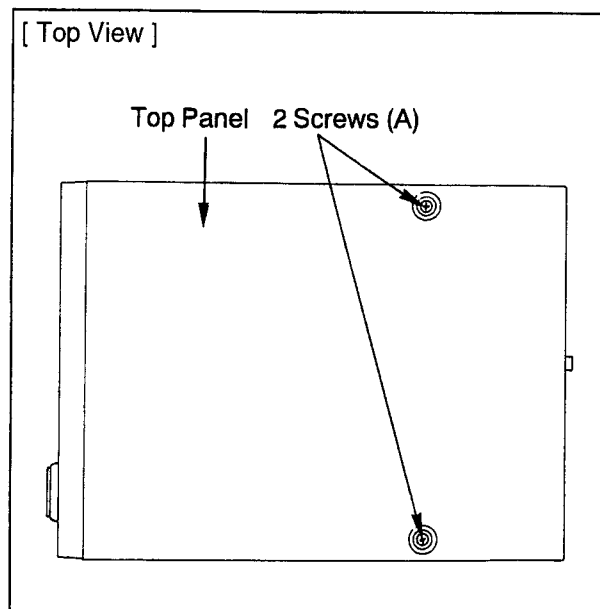
Figure D1.

The above flowchart describes the order of steps for removing the cabinet parts and certain printed circuit boards in order to gain access to the unit, follow the steps in the reverse order.

2-2 DETAILED DISASSEMBLY METHOD

2-2-1. Removal of the Top Panel

1. Unscrew 2 screws (A) on the Top Panel.
2. Carefully lift the rear of the Top Panel and slide it as shown in the arrow (Figure D 2).



2-2-2 Removal of the Front Panel

1. Remove the Jog Dial on the Front Panel.
2. Unscrew the 2 screws (B) as shown in the Figure.
3. Unlock 2 locking portions (F1), and carefully pull out the Front Panel from the deck (Figure D3.).

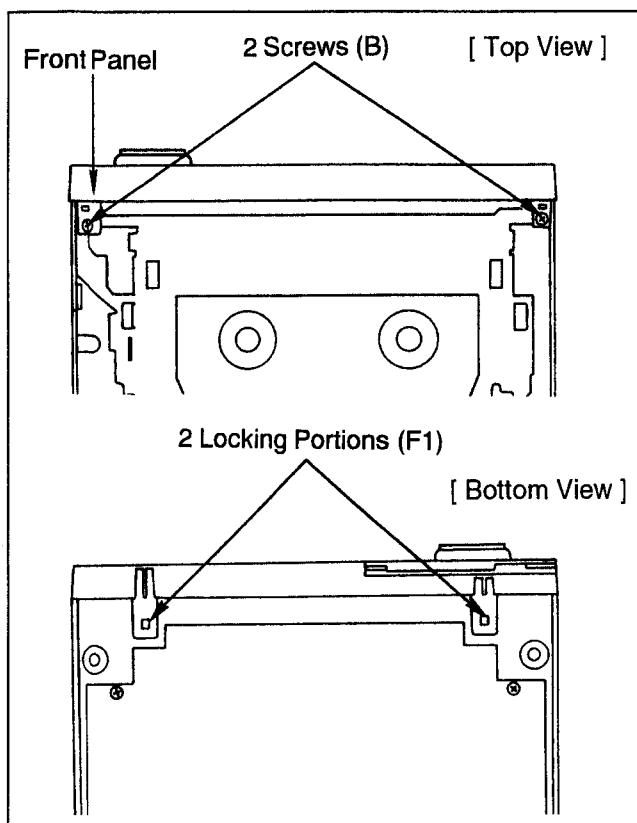


Figure D3

2-2-3. Removal of the Bottom Plate

1. Unscrew 6 screws (C) on the Bottom Plate.
2. Lift off the Bottom Plate (Figure D4.).

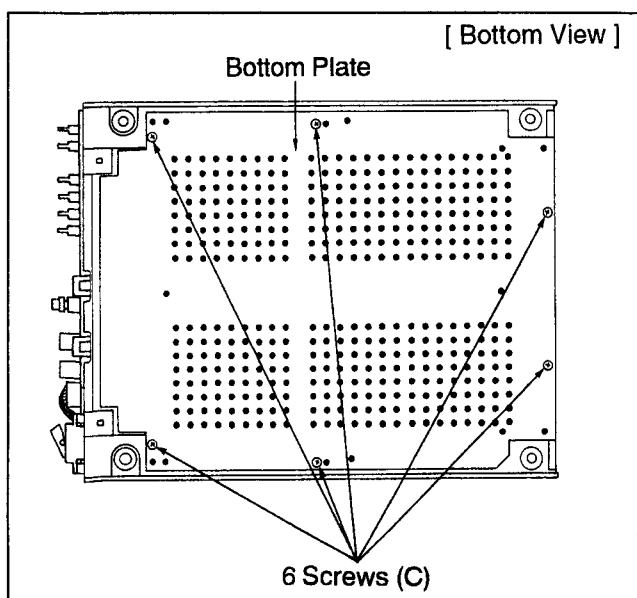


Figure D4

2-2-4. Removal of the Timer and Operation C.B.A.

1. Disconnect the 2 Flexible Wires from the connector P6701 and P6702 on the Timer and Operation C.B.A..
2. Unscrew the 2 screws (D) and a screw (D-1) on the Timer and Operation C.B.A and unlock 5 locking portions (F2).
3. Carefully remove the Timer and Operation C.B.A. (Figure D5.)

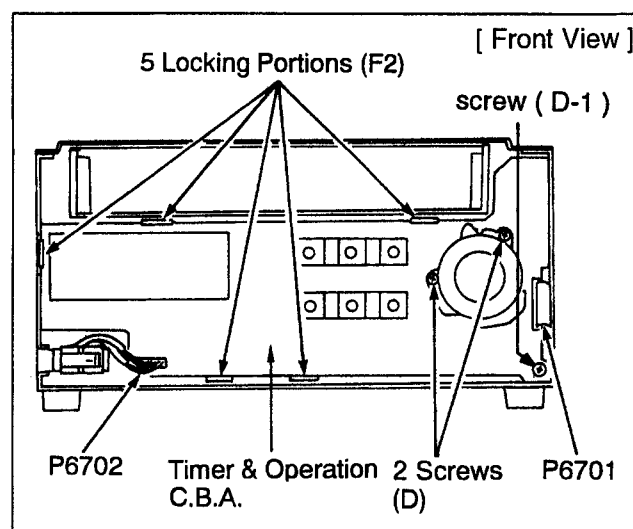


Figure D5

2-2-5. Removal of the Cassette Compartment Unit

1. Unscrew 2 screws (E) and slide the Cassette Holder Unit appearing 2 screws (F) and then unscrew 2 screws (F) (Figure D6.).
2. Disconnect the Flexible Wire from connector P1508 mounted on the Front Loading C.B.A., then carefully pull out the Cassette Compartment Unit.

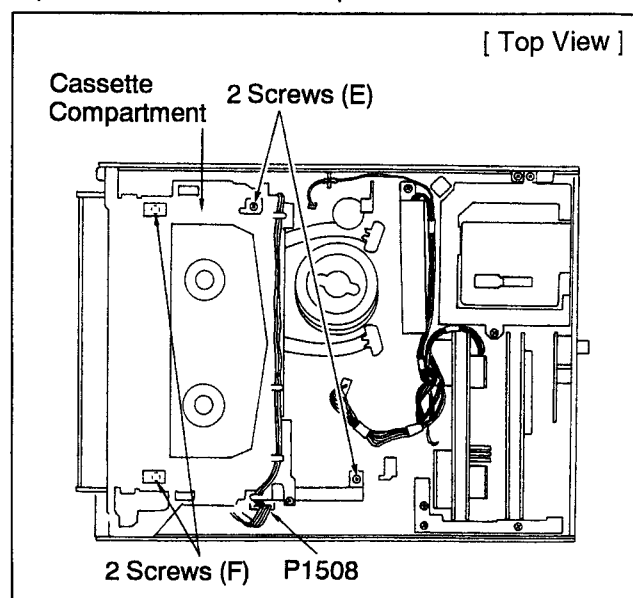


Figure D6

2-2-6 Removal of the Rear Panel

1. Unscrew 4 screws (G) and a screw (H) on the Rear Panel.

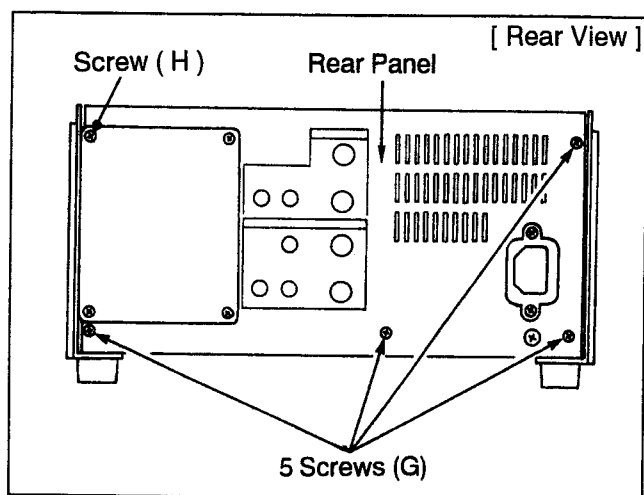


Figure D7

2-2-7 Removal of the Rear Jack C.B.A.

1. Unscrew the 5 screws (J) and unscrew the 2 screws (I) as shown in Figure D8.

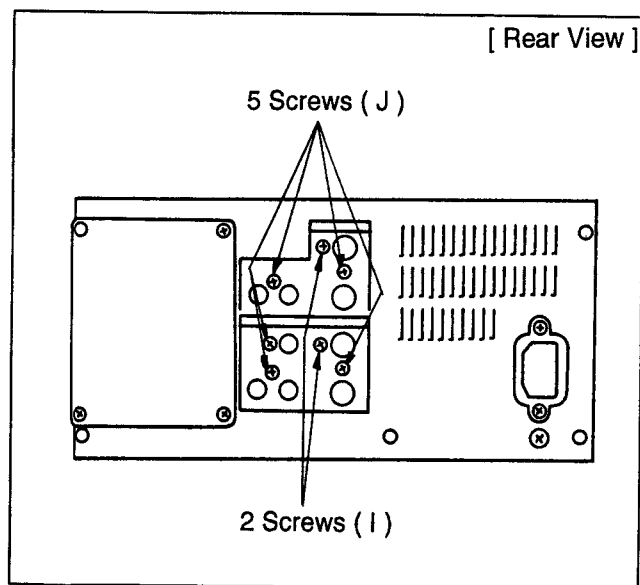


Figure D8

2-2-8 Removal of the Power Unit

1. Disconnect the 2 Flexible Wires from the connector P1001 and P1102 on the Power Unit.
2. Unscrew 2 screws (K) on the Power Unit Shield Case (Figure D9.).
3. Carefully lift out the Power Unit.

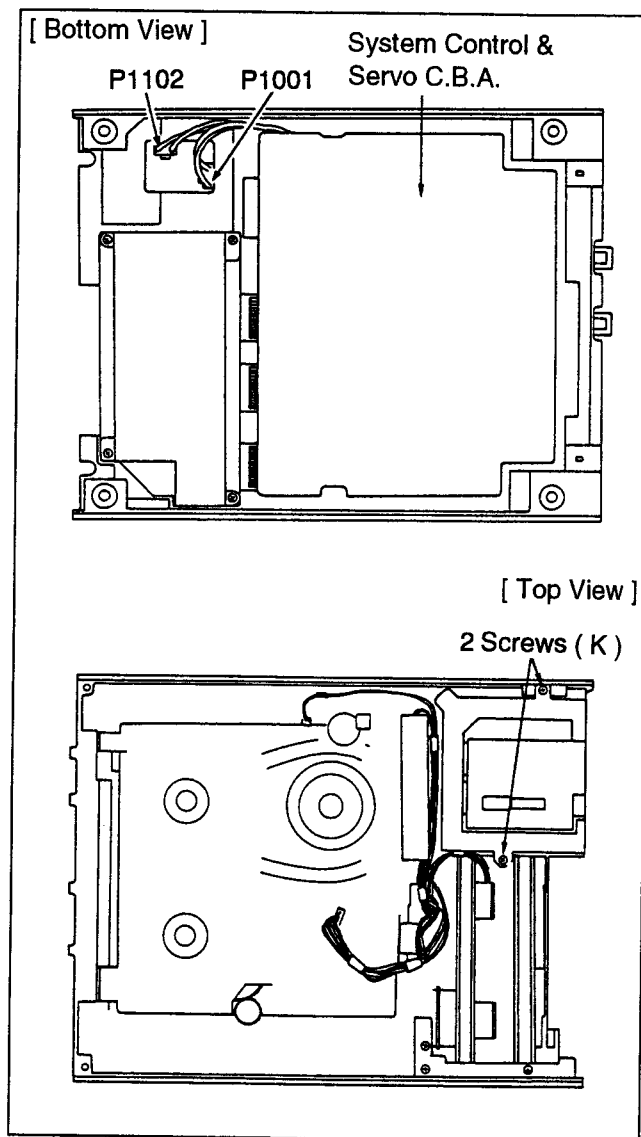


Figure D9

2-2-9 Removal of the Audio C.B.A.

1. Disconnect the 4 Flexible Wires from the connector P4001, P4002, P4003 and P4502 on the Audio C.B.A. (Figure D10.).
2. Carefully pull out the Audio C.B.A. (Figure D11.).

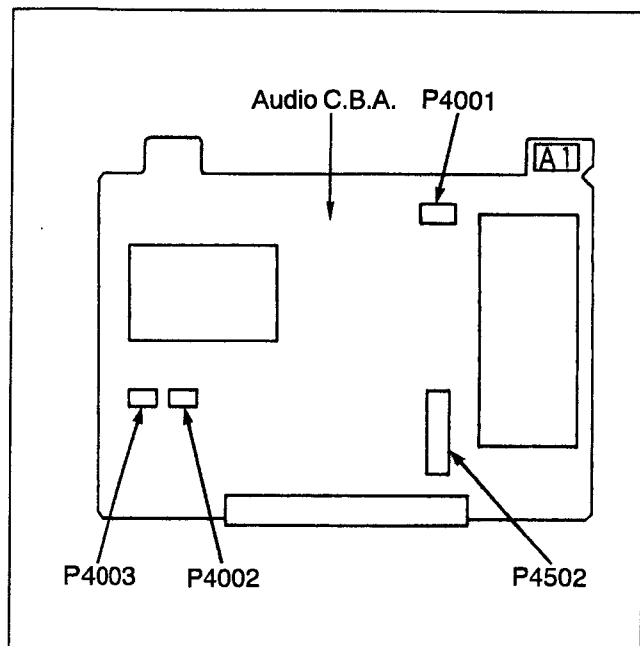


Figure D10

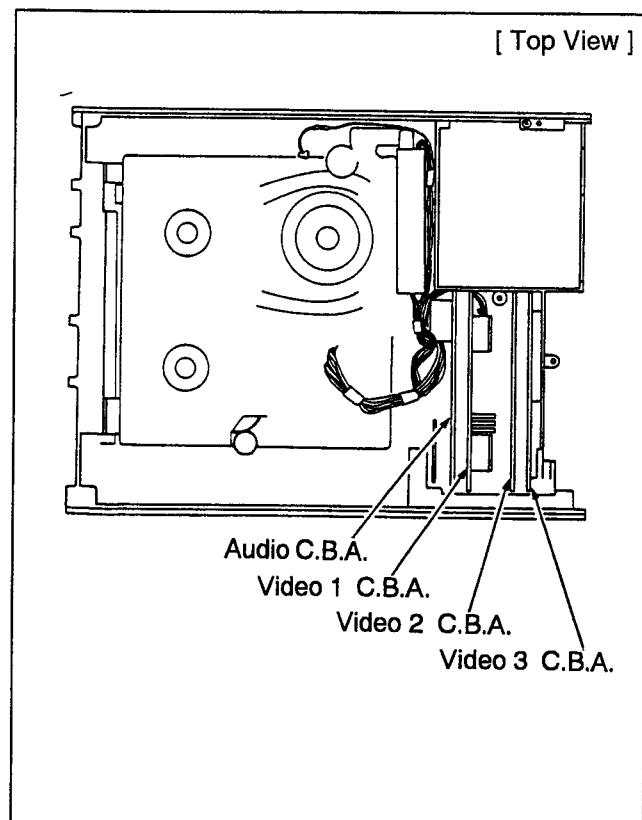


Figure D11

2-2-10 Removal of the Video 1 C.B.A.

1. Disconnect the Flexible Wires from the connector P3002 on the Video 1 C.B.A..
2. Carefully pull out the Video 2 C.B.A. (Figure D12.).

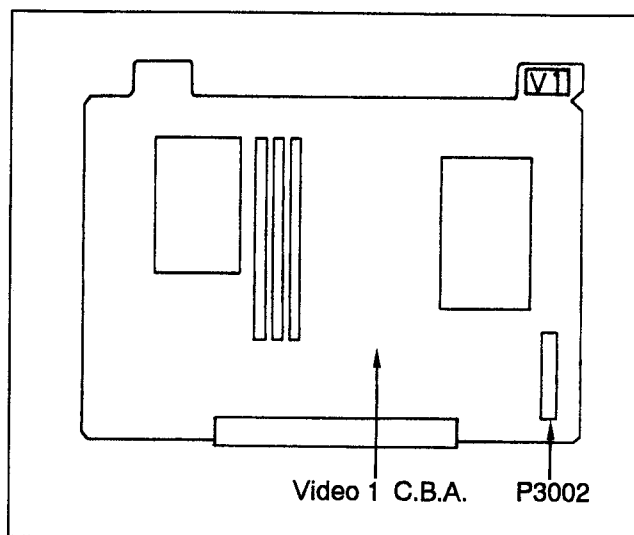


Figure D12

2-2-11 Removal of the Video 2 C.B.A.

1. Carefully pull out the Video 2 C.B.A. (Figure D11.).

2-2-12 Removal of the Video 3 C.B.A.

1. Carefully pull out the Video 3 C.B.A. (Figure D11.).

2-2-13 Removal of the Mechanism Unit

1. Unscrew a screw (L) on the Head Amp Shield Case and carefully remove the Head Amp C.B.A..
2. Unscrew the 2 screws (M) on the Mechanism Unit and carefully remove the Mechanism Unit. (Figure D13-1 and D13-2.)

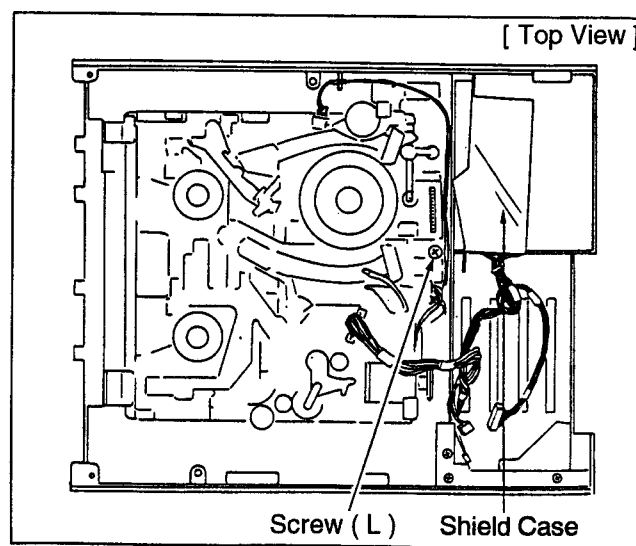


Figure D13-1

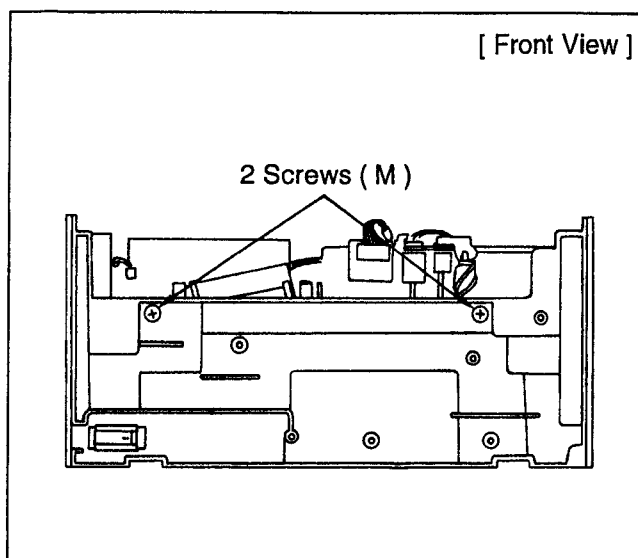


Figure D13-2

2-2-14 Removal of the System Control & Servo C.B.A.

1. Unscrew the 4 screws (N) on the System Control & Servo C.B.A. and carefully open the System Control & Servo C.B.A. as shown in Figure D14.

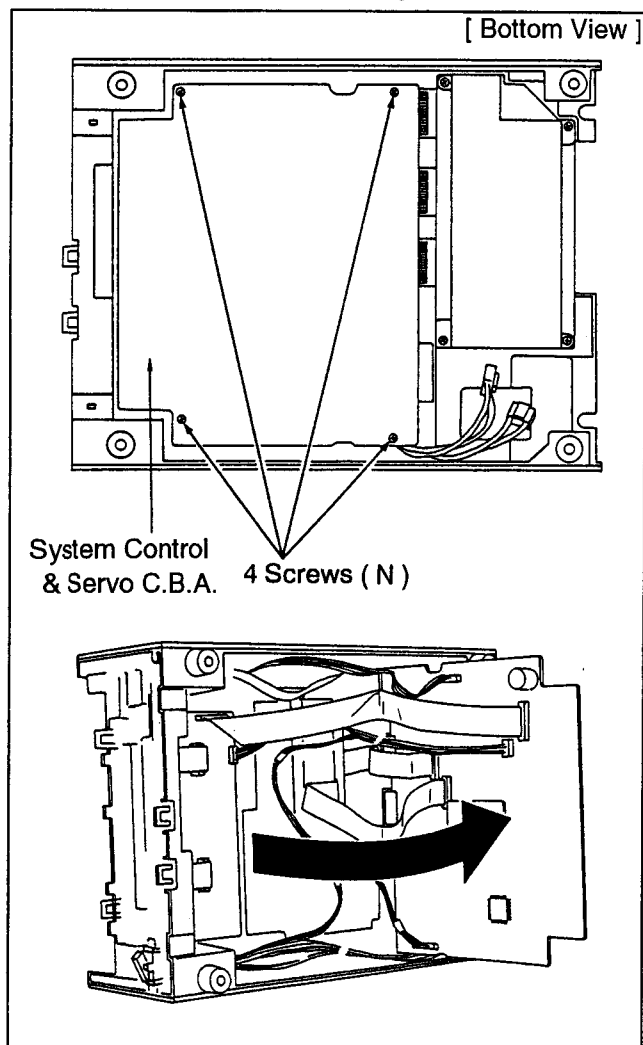


Figure D14

2-2-15 Removal of the Reel Drive C.B.A.

1. Disconnect the 4 Flexible Wires from the P2701, P2702, P2704 and P2705 on the Reel Drive C.B.A..
2. Unlock the 3 clamps (F3) on the Reel Drive C.B.A..
3. Remove the Reel Drive C.B.A..

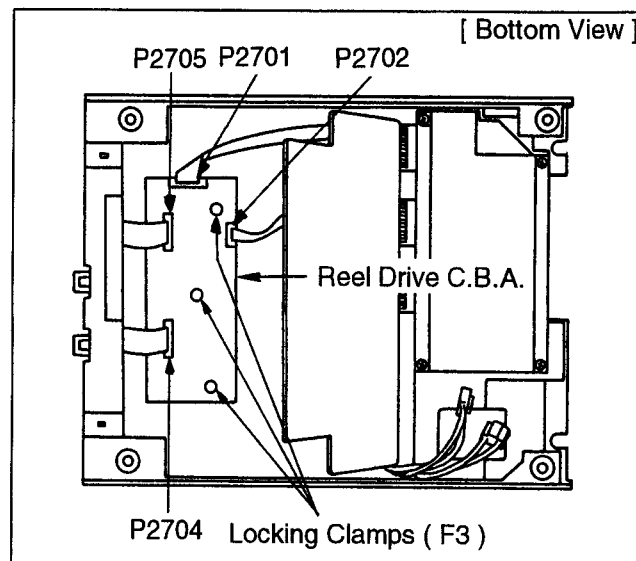


Figure D15

2-2-16 Removal of the Mother C.B.A.

Note: Before removing the Mother C.B.A., be sure to remove the Power Unit, Rear Jack C.B.A., Video Video (1), (2) and (3) C.B.A., Audio C.B.A., and System control & servo C.B.A..

1. Unscrews the 4 screws (O) on the Mather C.B.A..
2. Carefully pull out the Mother C.B.A..

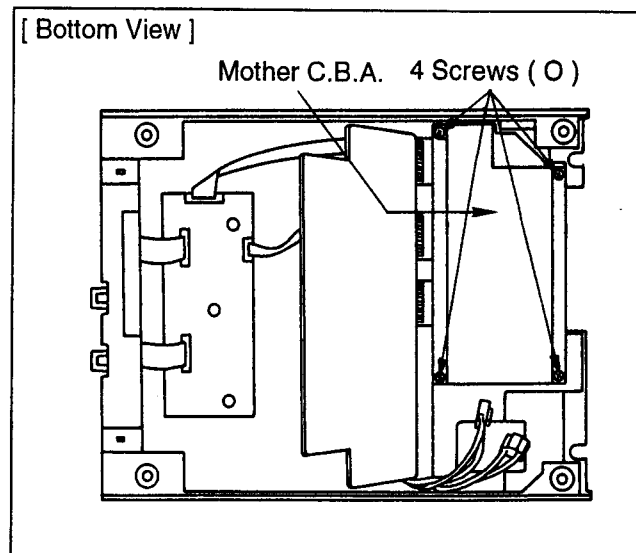
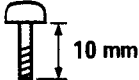
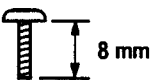
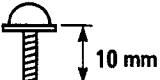
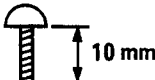
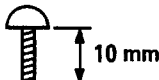
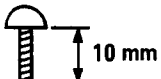
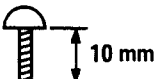
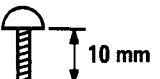
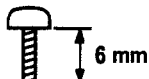

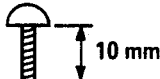
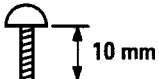
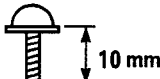
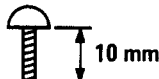
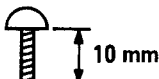
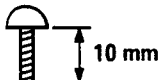


Figure D16

2-3 SCREWS

A list of screws used in item 2-2.

(A)  VHD0222 (SILVER)	(B)  XTW3+10LR (BLACK)	(C)  XTV3+10JFR (GOLD)	(D)  XTV3+10JFR (RED)	(D-1)  XTV4+10JFR (RED)
(E)  XTV4+10JFR (RED)	(F)  XTV4+10JFR (RED)	(G)  XTV4+10JFR (RED)	(H)  XYN26+6FE (BLACK)	(I)  XYN26+6FE (BLACK)
(J)  XTV4+10JFR (RED)	(K)  XTV4+10JFR (RED)	(L)  XTV3+10JFR (GOLD)	(M)  XTV4+10JFR (RED)	(N)  XTV4+10JFR (RED)
(O)  XTV4+10JFR (RED)				

NOTE

DISASSEMBLY

2

SECTION 3

MECHANISM

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3-1. PARTS LOCATION

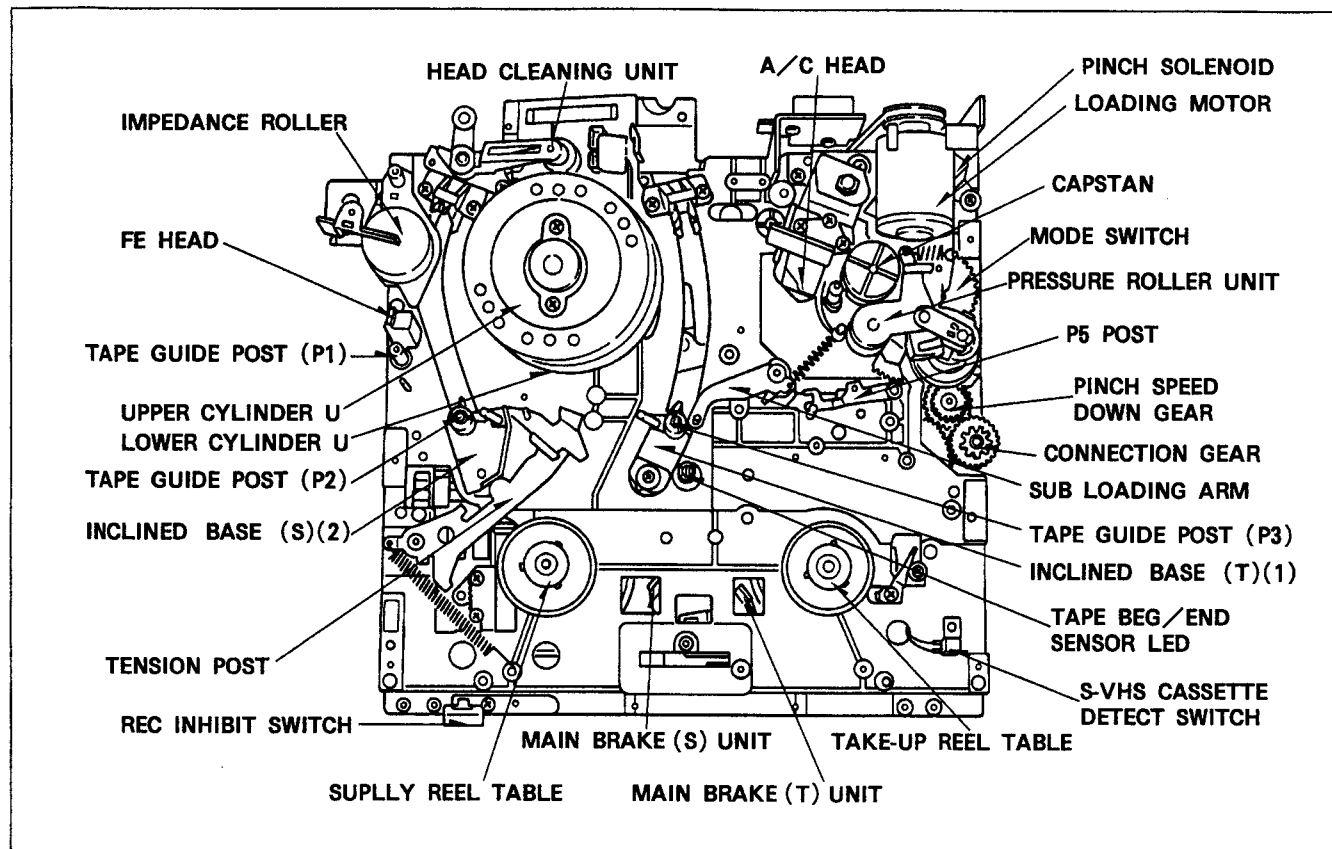


Figure M1 Top View

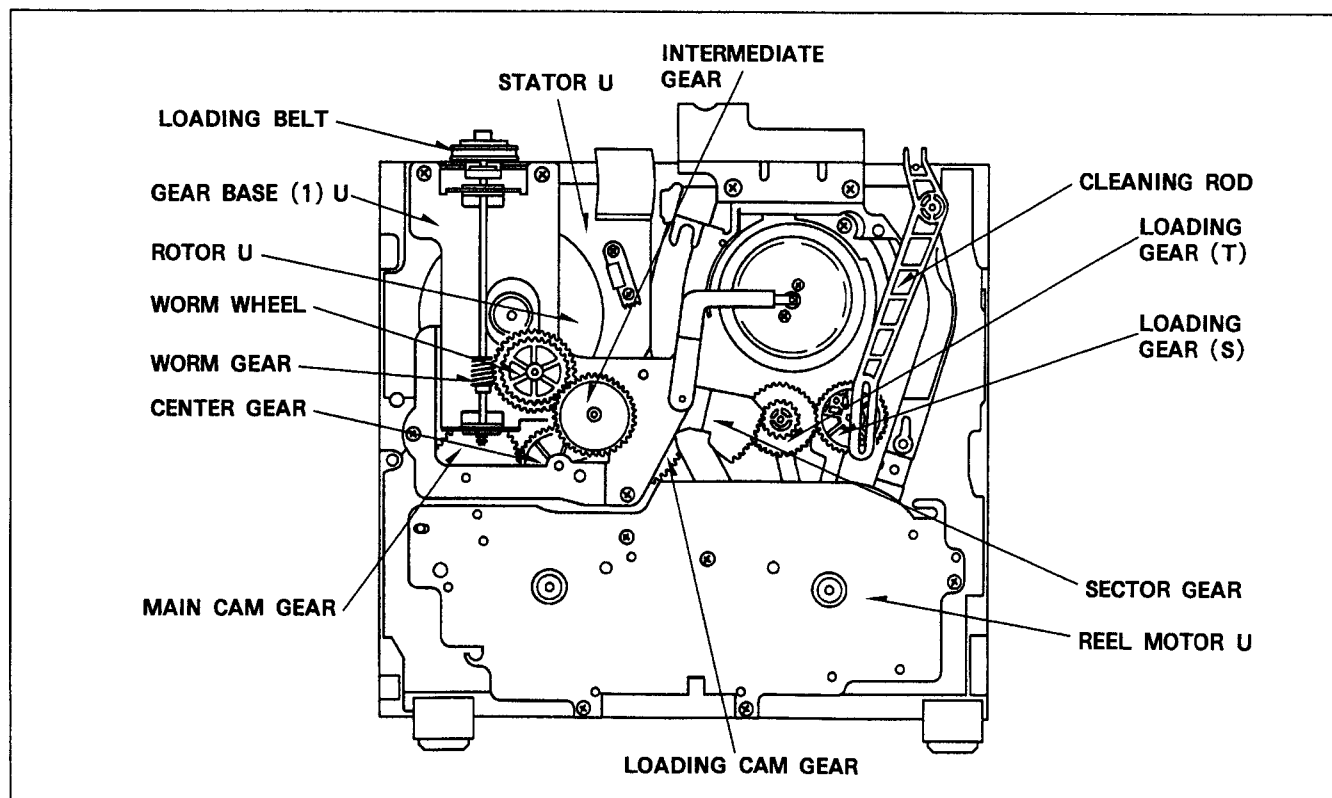
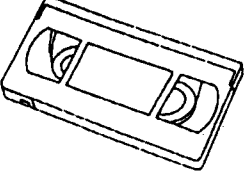
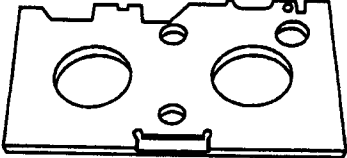
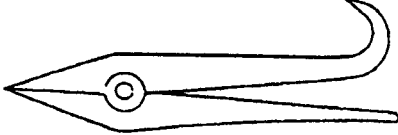



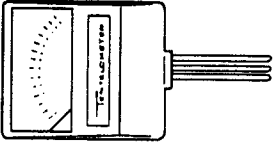
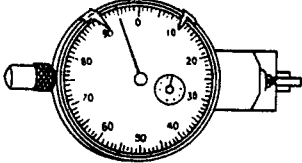
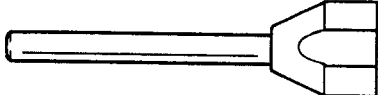
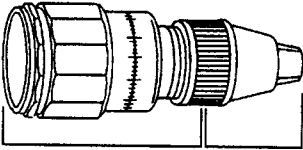
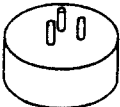
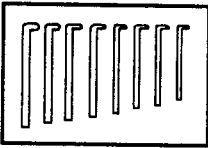
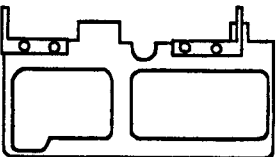
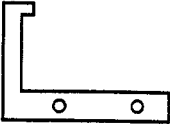


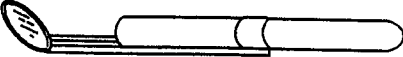

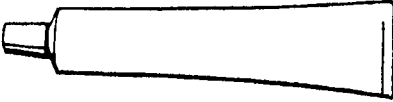
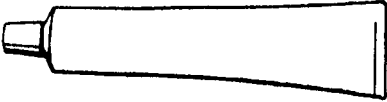


Figure M2 Bottom View

3-2. SERVICING FIXTURES AND TOOLS

The specified servicing fixture must be used to conduct adjustment.
The following fixtures, tools and measuring equipments are required to conduct complete Adjustments.

VFM8180HADH; VHS Alignment Tape 	VFK1012; Post Adjustment Plate 	VFK0335 ; Retaining Ring Remover 
VFK0329 ; Post Adj. Screwdriver 	VFK0328 ; H-Position Adj. Screwdriver 	VFK0330 ; Fine Adj. Screwdriver (3mm) 
VFK0132 : Back Tension Meter (Tentelometer, Made in U.S.A) 	VFK0190 ; Reel Table Height Fixture 	VFK0951; Centering Fixture 
VFK0133 ; Dial Torque Gauge VFK0180 ; Plastic Clamper Only  <div>01330180</div>	VFK0134 ; Adaptor for VFK0133 	VFK0326 ; Hex. Wrench Set (0.7, 0.9, 1.2, 1.5, 1.6, 2, 2.4, 3 mm) 
VFK0236 ; Tension Post Adj. Plate 	VFK0806 ; Tension Sensor Adj. Fixture 	VFK27 ; Head Cleaning Stick 
VFK0269 ; L Type Screwdriver 	VFM0948 ; Check Light 	VFK66 ; Fan Type Tension Gauge 
VFK0680 ; S.C.R. Grease (White) (for plastic part) 	MOR265 ; Morlytone Grease (Black) (for metal part) 	VFK0131 ; High Quality Oil (for Capstan)
		Cleaning Liquid (Alchol) (Tape Tronsport Rubber Parts etc.) << PURCHASE LOCALLY >>

3-3. HOW TO EJECT MANUALLY

If the electrical circuit is defective and the action of unloading and front unloading don't work properly, it is possible to eject manually as follows.

1. Take out the Main AC.
2. Release the direction as shown in Figure M3.
3. Release the Wormshaft to clockwise unit cassette is ejected.

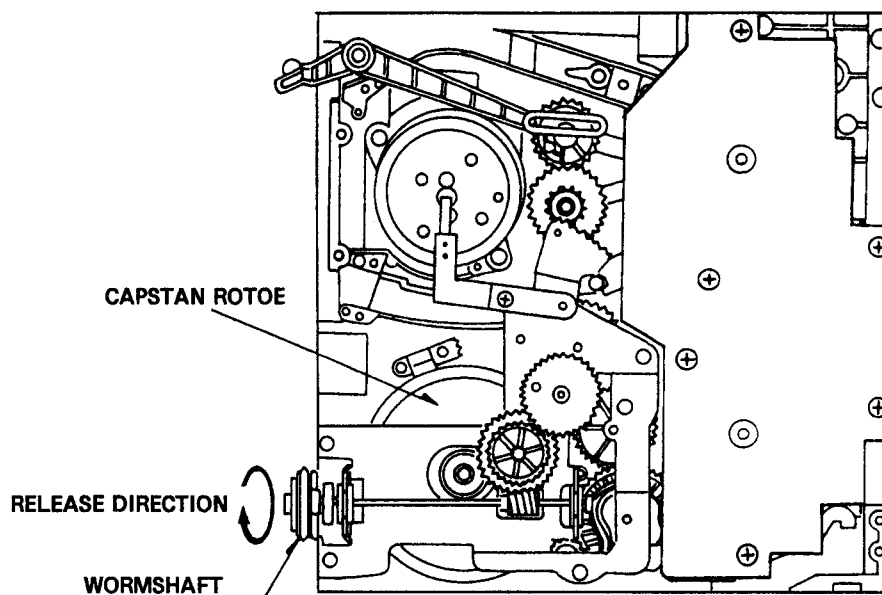


Figure M3 How to Eject Manually

3-4. MAINTENANCE PROCEDURES

3-4-1. REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout its useful life. The user or service dealer should perform these maintenance regularly to ensure that maximum utility is obtained from the machine.

The VCR is a complicated piece of equipment. It contains many belts, rollers, heads etc., which become worn, and deteriorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance be done according to the maintenance chart to maintain the functions of the VCR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

The VCR used for business applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, or poor environmental conditions may adversely affect the lifespan and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for his expenditure. Accordingly, the necessity of regular maintenance should be fully explained at the time of sale, as well as during after-sale repairs.

3-4-2. MAINTENANCE CHART

The following periodic maintenance is required to prolong the life of the machine.

Ref. No. IN P/L	Parts Name	Hour										Ref. No. IN P/L	Parts Name	Hour									
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000			500	1000	1500	2000	2500	3000	3500	4000	4500	5000
----	Tape Transporter	●	●	●	●	●	●	●	●	●	●	2-2	Loading Belt				◎				◎		
1-19	A/C Head U	●	●	●	●	●	●	●	◎	●	●	2-39	Loading Cam Gear								▲		
1-41	Upper Cylinder	●	◎	●	◎	●	◎	●	◎	●	◎	2-1	Worm Shaft								x		
1-42	Cylinder U	●	●	●	●	●	●	●	◎	●	●	2-3	Worm Wheel								x		
2-24	Supply Reel Table U								◎			1-56	FE Head	●	●	●	●	●	●	●	◎	●	●
2-23	Takeup Reel Table U								◎			1-36	Mode Switch								◎		
2-8	Stator Base Unit								◎			2-33	Main Cam Gear								▲		
2-28	Capstan Rotor U	●	●	●	△	●	●	●	△	●	●	1-48	Inclined (S) U								▲		
1-25	Pressure Roller U	●	●	●	◎	●	●	●	◎	●	●	1-45	Inclined (T) U								▲		
1-68	Head Cleaning U		◎		◎		◎		◎		◎	1-7	Loading Motor U								◎		
2-16	Main Brake (S)				◎				◎			1-39	P5 Arm U								▲		
2-18	Main Brake (T)				◎				◎														

*NOTE:

Symbol	Maintenance	Requirement	Remark
●	Cleaning	Ethyl-alcohol or Cleaning Liquid (Purchase locally)	Wipe dirt from the parts using soft cloth impregnated with Ethyl-Alcohol. Note: When cleaning rubber parts, avoid using excessive alcohol since it may accelerate deterioration of these parts. After cleaning with alcohol, wipe the alcohol quickly and thoroughly.
◎	Replacement		
△	Lubrication	High Quality Spindle Oil (Purchase locally)	Supply one or two drops of oil.
▲	Greasing	Molytone Grease (MOR265)	Wipe the old grease and apply new grease.
x	Greasing	S.C.R. Grease (VFK0680)	Wipe the old grease and apply new grease.

3-4-3. LUBRICATION PROCEDURES OF THE CAPSTAN SHAFT

1. Remove the Pressure Roller Unit.
2. Remove the Thrust Screw.
3. Apply two drops of the oil (VFK0131) on the top of Capstan Shaft as shown in Figure M6-A.

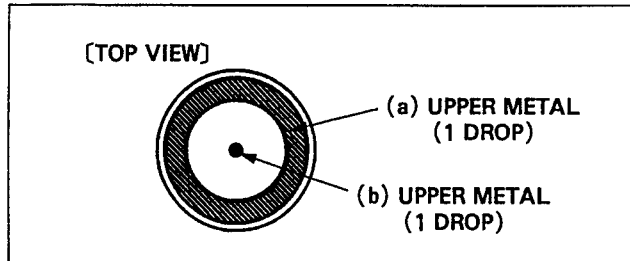


Figure M6-A

4. Turn the Thrust Adjustment Screw slowly to clockwise until the Capstan Rotor just starts turning (separate from the Capstan Stator).
5. Turn the Thrust Adjustment Screw another 180° clockwise as shown in Figure M6-B.
6. Install the Pressure Roller Unit.
7. Wipe the extra oil.

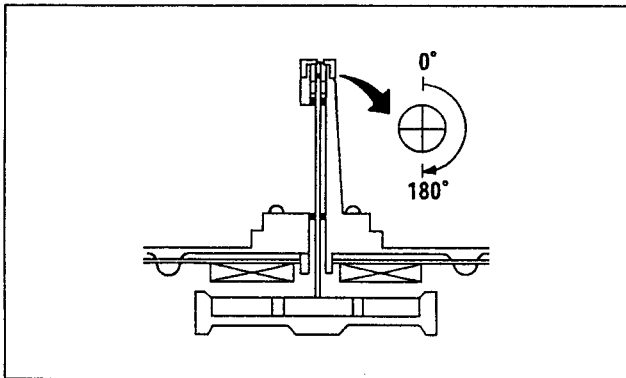


Figure M6-B

3-4-4. PROCEDURES FOR CLEANING OF THE CYLINDER UNIT

1. Position the Video Head to permit access for cleaning and hold the upper cylinder to keep it from turning while cleaning.
2. Gently rub the Video Head in direction of tape travel with Head Cleaning Stick moistened with Cleaning.
3. Repeat for the other video heads (Figure M7).

Note: 1. Do not rub vertically.
2. Do not apply any pressure to heads.

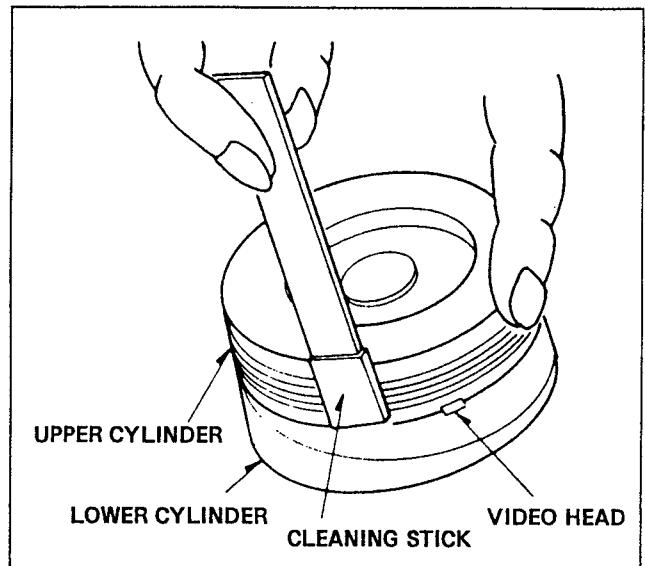
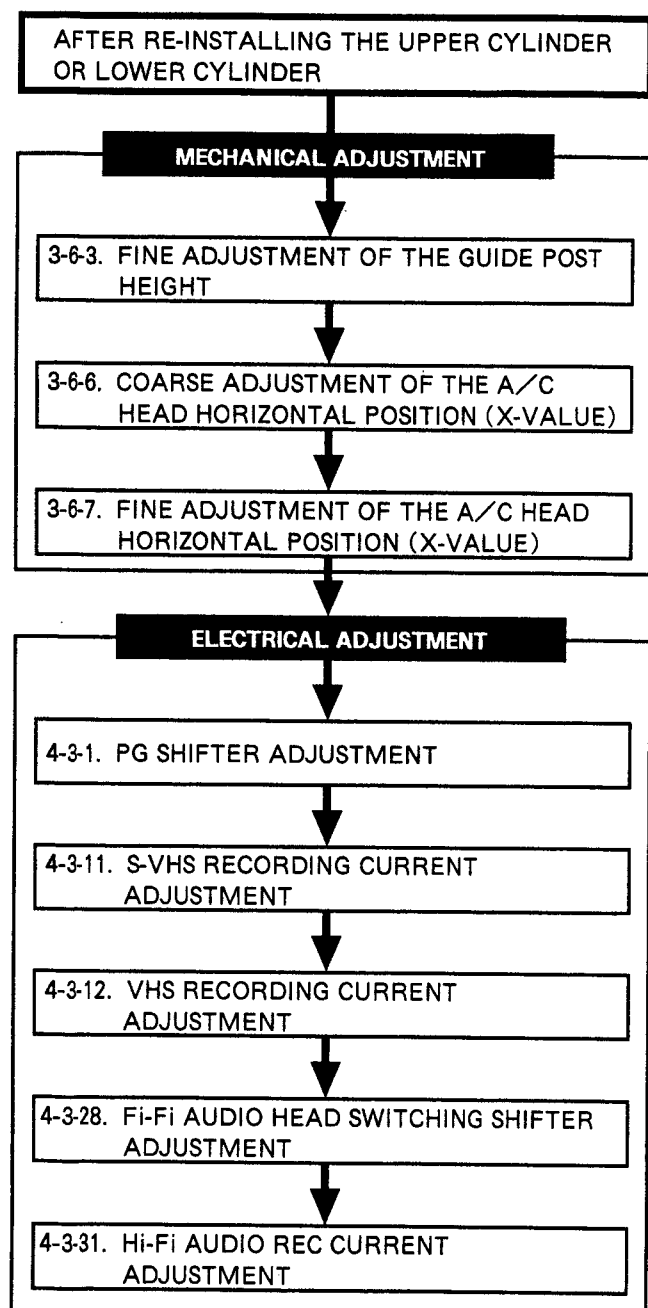
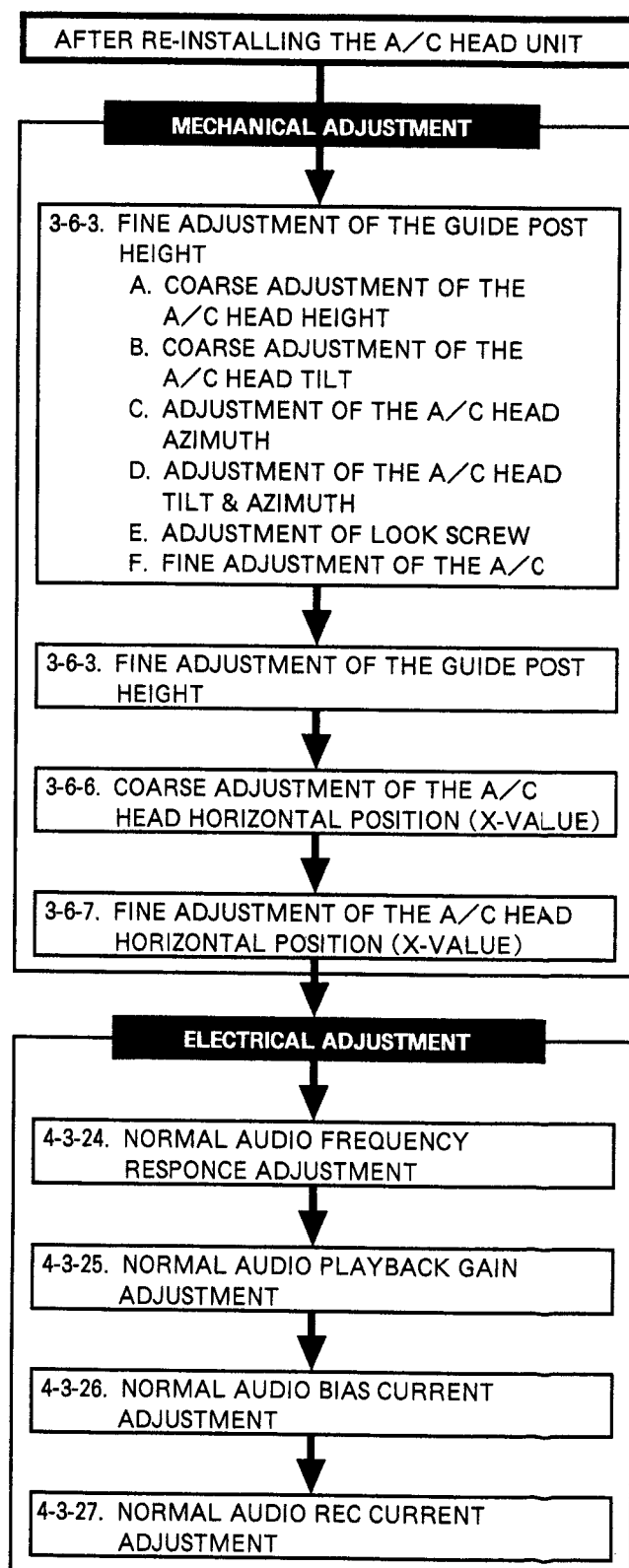


Figure M7

3-4-5. ADJUSTMENTS AFTER RE-INSTALLING THE UPPER CYLINDER, LOWER CYLINDER



3-4-6. ADJUSTMENTS AFTER RE-INSTALLING THE A/C HEAD UNIT



3-5. MECHANICAL PARTS REPLACEMENT PROCEDURES

3-5-1. REPLACEMENT OF THE UPPER CYLINDER UNIT

1. First remove two screws as shown in Figure M10-A.
Then unsolder of the soldered portions indicated by arrows on the Upper Cylinder, and finally remove the Upper Cylinder.

Note: Soldered portion can be easily removed by using solder sucking wire, etc.

2. The Upper Cylinder unit can be reinstalled by reversing the removal procedure.
However, when Upper Cylinder is installed, be extremely carefully so that white portion of P.C.Board of Upper Cylinder correctly matches the white portion of bottom cylinder as shown in Figure M10-A.

Note: If the Upper Cylinder Unit is reversal installed, no color will appear when playing back pre-recorded tapes.

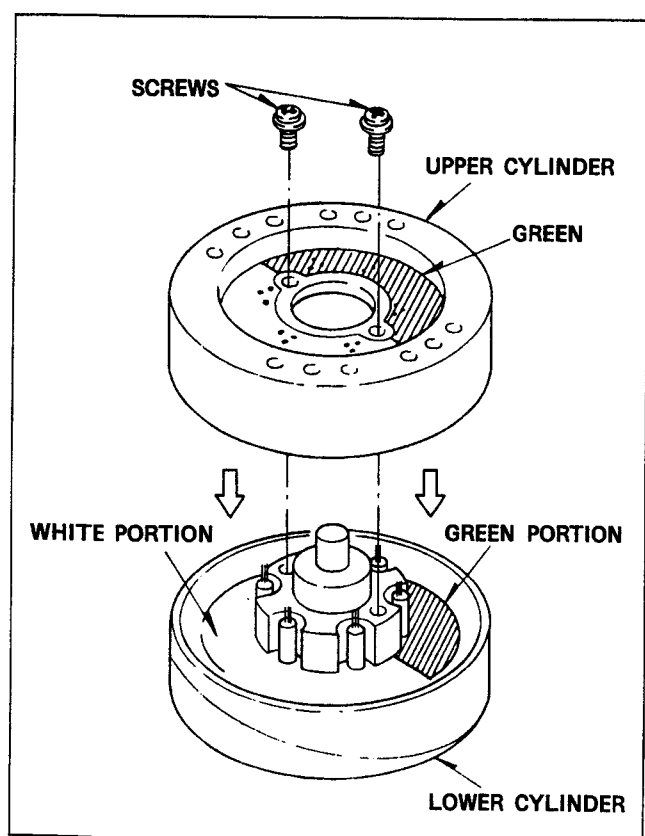


Figure M10-A

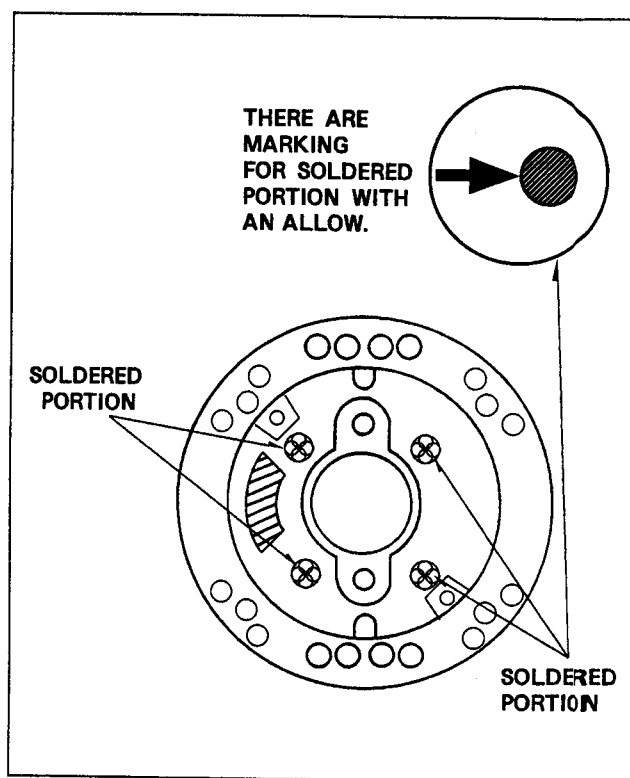


Figure M10-B

3-5-2. REPLACEMENT OF THE LOWER CYLINDER UNIT

1. Unscrew the 2 screws and remove the Head Amp.
2. Remove the Cleaning rod from bottom side.
3. Unscrew 3 screws (A). Since there is very little clearance between DD Cylinder (Lower Cylinder) Unit and Chassis, remove the Cylinder gently and carefully (Figure M11).

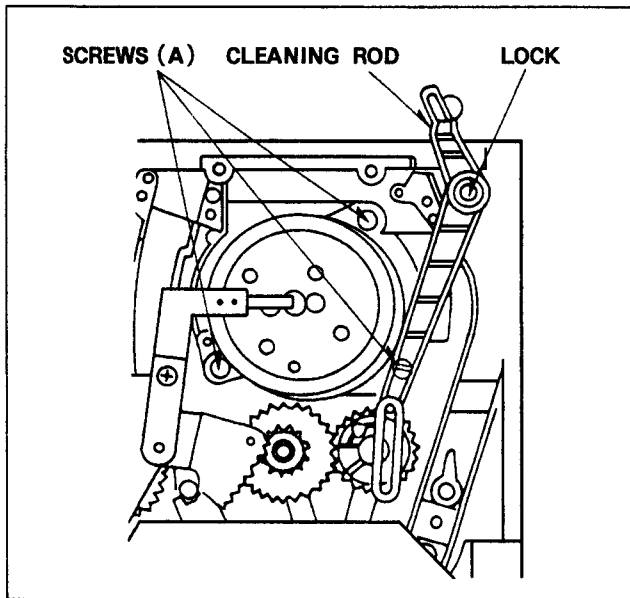


Figure M11

4. Reinstall the new DD Cylinder (Lower Cylinder) Unit in the chassis, tighten the 3 screws (A). Then connect a connectors and reinstall the Cleaning Rod.
5. Re-install the Head Amp C.B.A.

Note: After reinstall the Upper Cylinder Unit should be perform Mechanical and Electrical adjustment (Refer to 3-4-5. Maintenance Procedures).

3-5-3. REPLACEMENT OF THE A/C HEAD (1) UNIT

1. Disconnect a connector (Figure M12).
2. Unscrew 3 (B)(C)(D) screws with spring and then remove the A/C Head Unit (Figure M12).

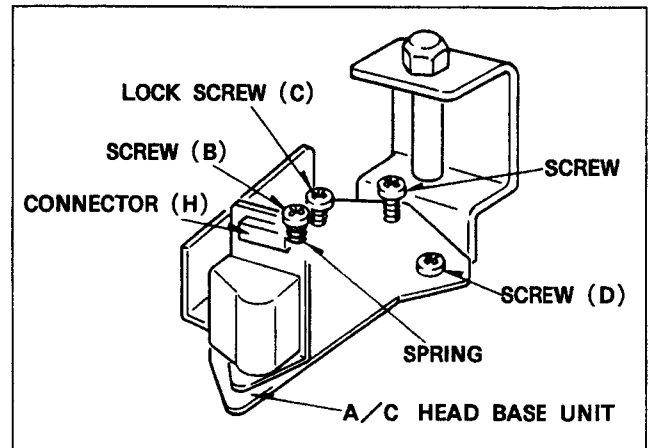


Figure M12

3. The A/C Head (1) Unit can be reinstalled by reversing the removal procedure.

Note: After reinstall the Upper Cylinder Unit should be perform Mechanical and Electrical adjustment (Refer to 3-4-6. Maintenance Procedures).

3-5-4. REPLACEMENT OF THE FULL ERASE HEAD

1. Disconnect a connector.
2. Unscrew a screw (E) and remove the Full Erase Head (Figure M13).

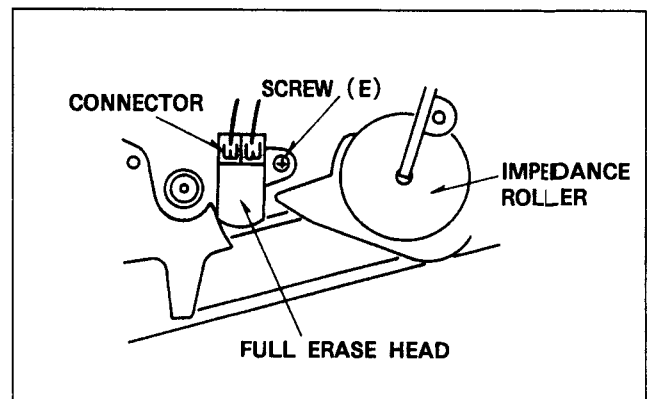


Figure M13

3. The new Full Erase Head can be reinstalled by reversing the removal procedure.

3-5-5. REPLACEMENT OF THE CAPSTAN ROTOR AND CAPSTAN STATOR

When replacing the Capstan stator unit the centre Fixing Tool must be used to fix the centre of Capstan Stator Unit.

1. Remove the loading belt.
2. Unscrew the 4 (F) screws and remove the Gear base Unit.
3. Carefully lift up the capstan rotor from the capstan housing, taking care so as not to lose the 2 oil seals as shown in Figure M14-A.

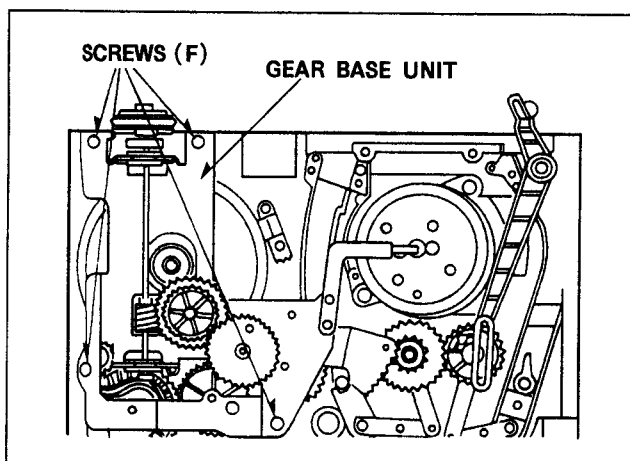


Figure M14-A

4. Remove the 2 oil seals.
5. Unscrew the 3 (G) screws and remove the Capstan Stator.
6. Place the capstan stator unit into position.
7. Loosely tighten the 3 (G) screws.
8. Insert the Centre Fixing Tool as shown in Figure M14-B.

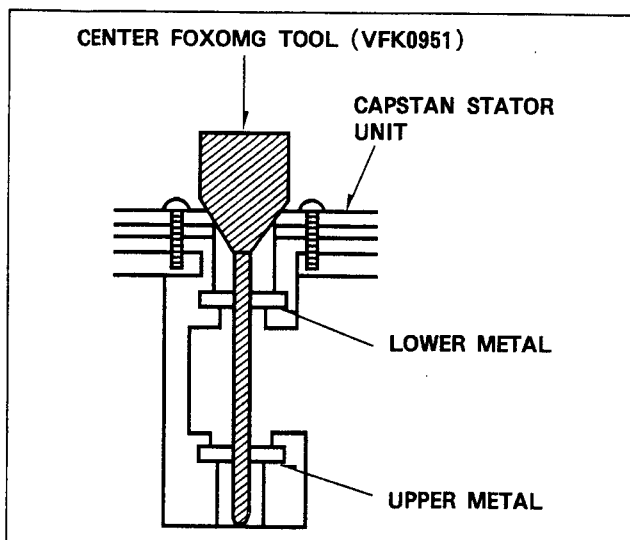


Figure M14-B

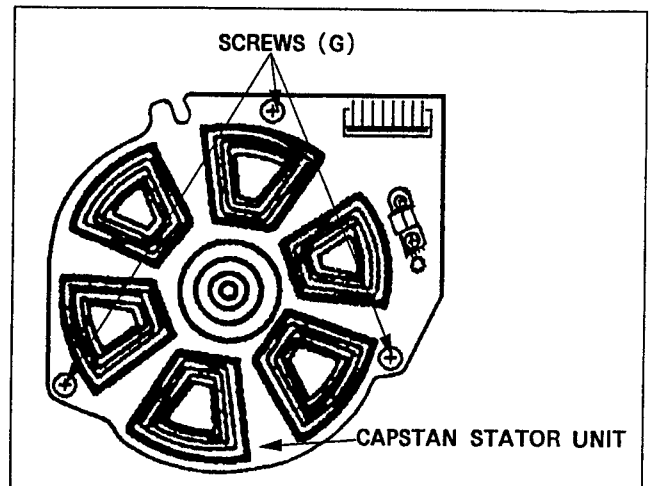


Figure M14-C

9. Tighten the 3 (G) screws.
10. Remove the centre fixing tool.
11. The new capstan rotor unit can be reinstalled by reversing the removal procedure.

3-5-6. REPLACEMENT OF THE CAPSTAN HOUSING UNIT

1. Remove the pressure Roller Unit.
2. Remove the Sub post spring from hook of Capstan Housing.
3. Unscrew the 3 screws (H) and remove the Capstan Housing.
4. Remove the 2 oil seals and thrust screw.

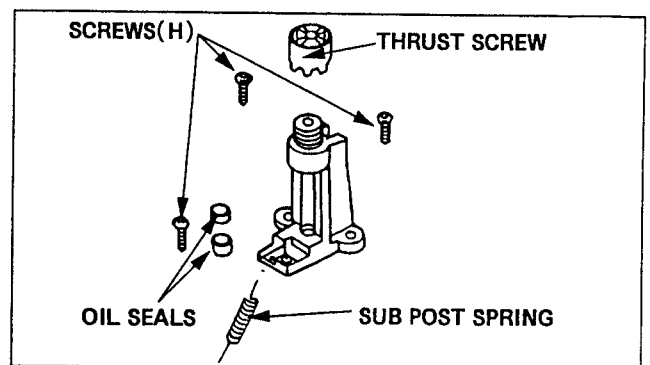


Figure M15

5. Replace the new Capstan Housing, 2 oil seals and thrust screw at same time.
6. Re-install the Capstan Housing Unit by reversing the remove procedure.

Note: After re-installing the thrust screw adjustment of the thrust screw are required. Replace the new Capstan Rotor, 2 oil seals and thrust screw at same time.

After re-installing the capstan rotor or capstan stator confirmation of FG out put level and adjustment of FG head gap are required.

3-5-7. REPLACEMENT OF THE INCLINED BASE (S),(T)

Supply Side

1. Unscrew a screw (I) and remove the head cleaning plate unit as shown in Figure M16-A.
2. Unscrew the 2 screws (J) and remove the post stopper.

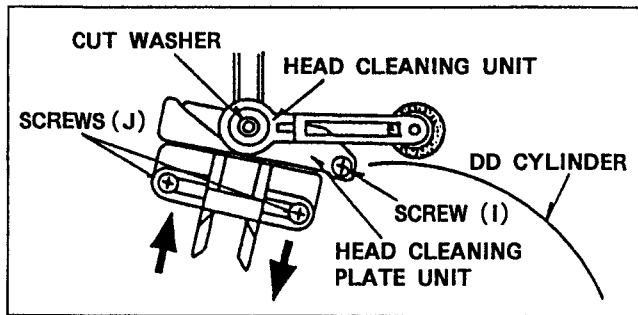


Figure M16-A

3. Remove the P2 post unit from loading arm (S) as shown in Figure M16-B.

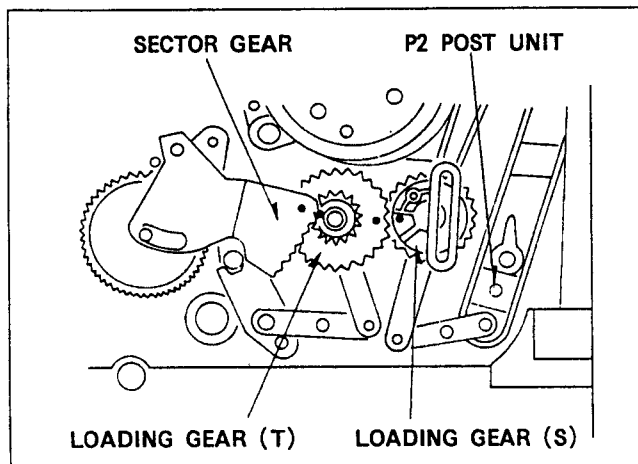


Figure M16-B

4. Pull out the Inclined base (S) from loading base.
5. The new inclined base unit can be reinstalled by reversing the removal procedure.

Note: Install post stopper pusing the arrow direction (A),(B) as shown in Figure M16-A. After re-installing the inclined base (S) confirmation of tape interchangeability and P2, P3 posts adjustments are required.

Take-up Side

1. Unscrew a screw (K) and remove the inclined base (T) as show in Figure M14.

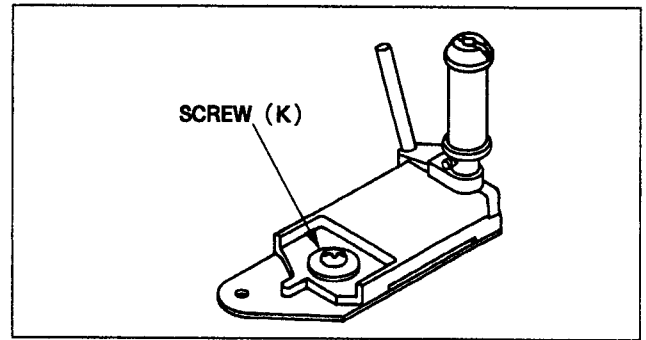


Figure M16-C

2. Install the inclined base (T) so that the tip of inclined base is center on the Plate Hole and then tighten screw (K).

Note: After re-installing the inclined base (T) confirmation of tape interchangeability and inclined base adjustment are required.

3-5-8. REPLACEMENT OF THE P5 POST

1. Remove the top cover and cassette holder.
2. Rotate the loading motor to clockwise, until the stop mode.
3. Remove the pressure roller unit.
4. Remove the pinch cam (Ref. to Replacement of the mode switch) and P5 pull out sector gear as shown in Figure M17.

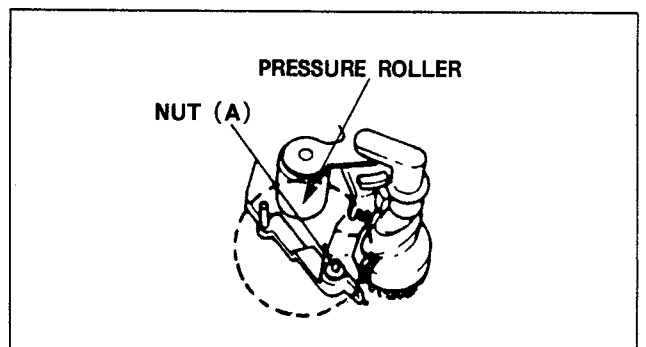


Figure M17

5. Unscrew a Nut (A) and Remove the P5 Post.
6. The new P5 post can be reinstalled by reversing the removal procedure.

Note: After-reinstalling the P5 post confirmation of tape waving and P5 post height adjustment are required.

3-5-9. REPLACEMENT OF THE REEL UNIT

1. Remove 6 screws (L) and carefully lift the DD Reel Unit.
2. Disconnect a connector.

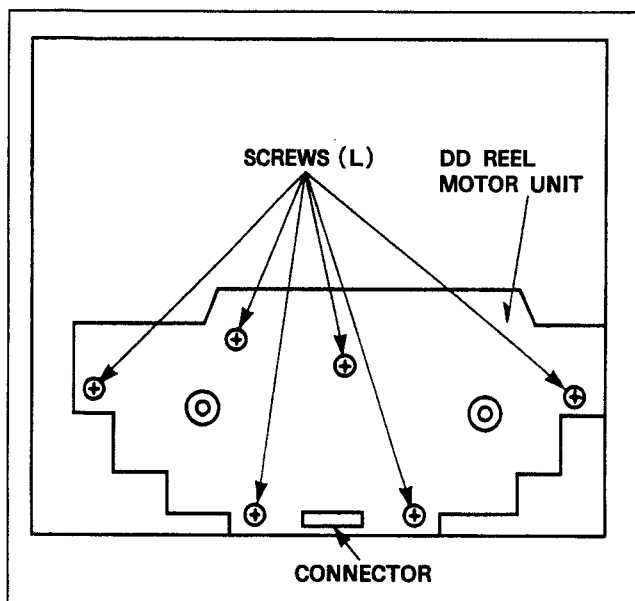


Figure M18-A

3. The Reel Motor Unit can be re-installed by reversing the removal procedure.

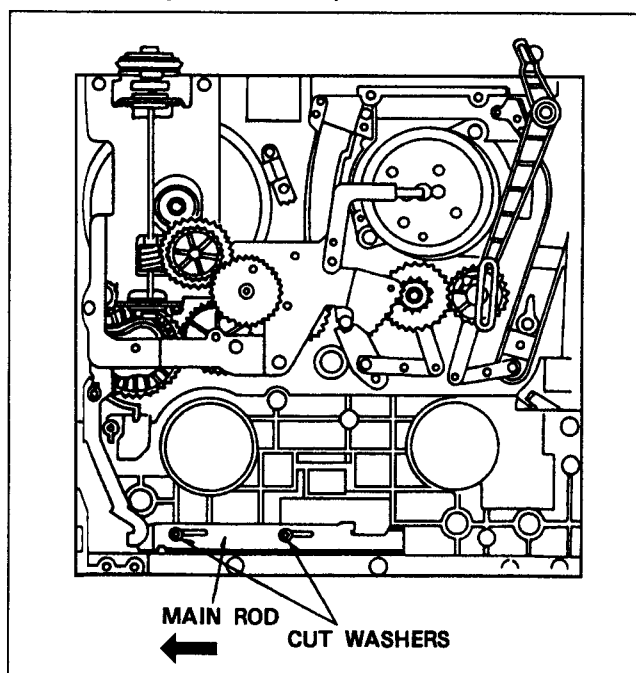


Figure M18-B

- Note:** When assembling the DD Reel Motor Unit, side the Main Rod to far left side by rotating a center Gear.

3-5-10. REPLACEMENT OF THE MAIN BRAKE (S),(T) UNIT

1. Remove the Reel Unit (Refer to Replacement of the Reel Unit).
2. Remove a Retaining Ring (A).
3. Remove the Main Brake (S),(T) with a spring.

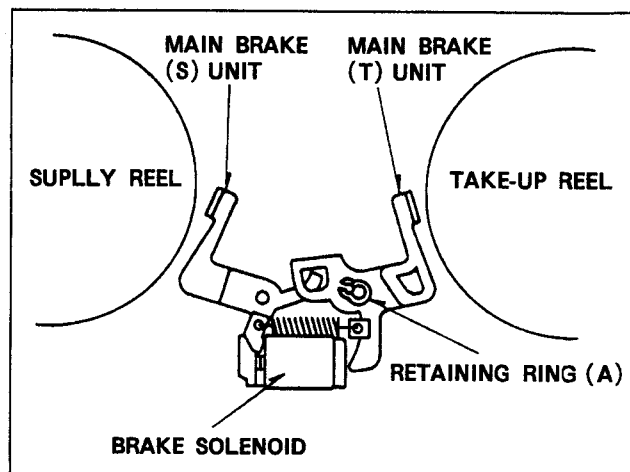


Figure M19

4. The new Main Brake (S),(T) Unit can be reinstalled by reversing the removal procedure.

- Note:** When assembling the DD Reel Motor Unit, slide the Main Rod to far left side by rotating a Center Gear (Figure M19).

3-5-11. REPLACEMENT OF THE PRESSURE ROLLER UNIT

1. Place the deck in or EJECT mode.
2. Remove the Pinch Can Cap.
3. Remove the Pressure Roller Unit.

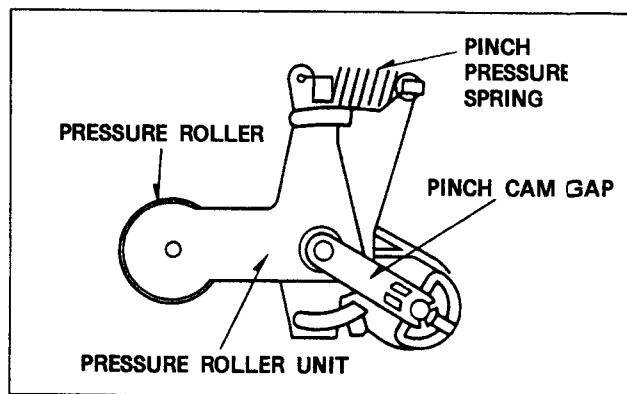


Figure M20

4. The new Pressure Roller Unit can be re-installed by reversing the removal procedure.

3-5-12. REPLACEMENT OF THE MODE SWITCH

1. Place the deck in the STOP mode.
2. Remove the Cassette Compartment Unit. (Refer to Disassembly Procedures).
3. Remove the Pinch Cam Cap and Pressure Roller Unit.
4. Unscrew the 2 screws and remove the Head Amp.
5. Remove the Pinch Cam.
6. Unscrew 2 screws (M) and remove the Loading Motor Base.
7. Unscrew a screw (N) and unsolder 5 of soldered portions.
8. Finally remove the Mode Switch.

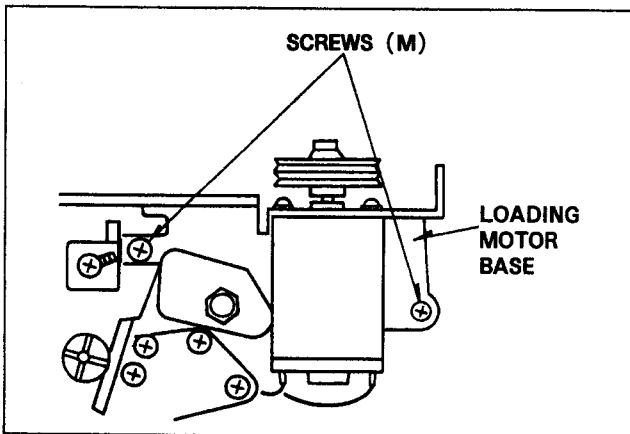


Figure M21-A

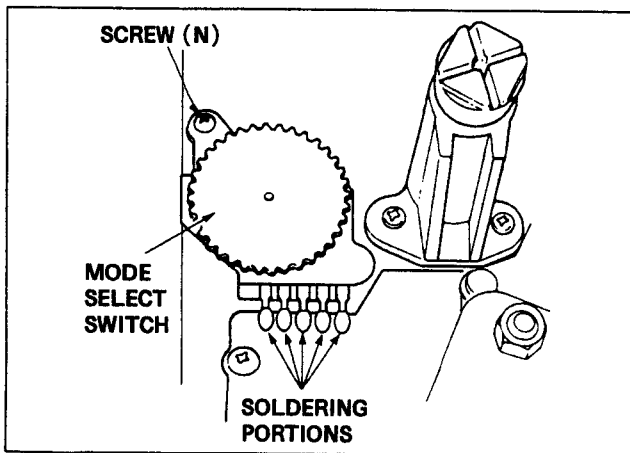


Figure M21-B

9. Install a Mode Switch and tighten screw (N), then solder 5 soldering portions.
10. Install the Pinch Cam and Pressure Roller Unit. (Refer to "Assembly Procedures of Pinch Cam & Pressure Roller Unit.")
11. Install the Loading Motor Base and tighten screw (M).
12. Install the Head Amp and tighten 2 screws.
13. Install the Cassette Compartment. (Refer to Reinstallation of Cassette Compartment.)

3-5-13. REPLACEMENT OF THE PINCH SOLENOID

1. Unscrew 2 screws (M) and remove the Loading Motor Base (Figure M21-A).
2. Unscrew 2 screws (O), Remove the Motor Pulley and Loading Motor (Figure M22-A).
3. Disconnect a connector (red) on the Motor Base C.B.A.
4. Unscrew 2 screws (P)(Figure M22-B) and remove the Pinch Solenoid.
5. Install the Pinch Solenoid on to the Motor Base so that the hole of the Motor Base should be the large hole of the Solenoid Base (Figure M22-C).
6. Tighten 2 screws (P).
7. Install a Loading Motor and tighten 2 screws (O).
8. Install the Loading Motor Base and tighten 2 screws (M)(Figure M21-A).

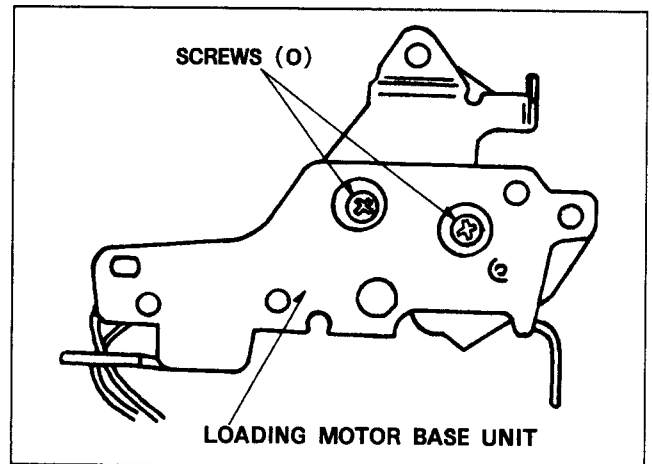


Figure M22-A

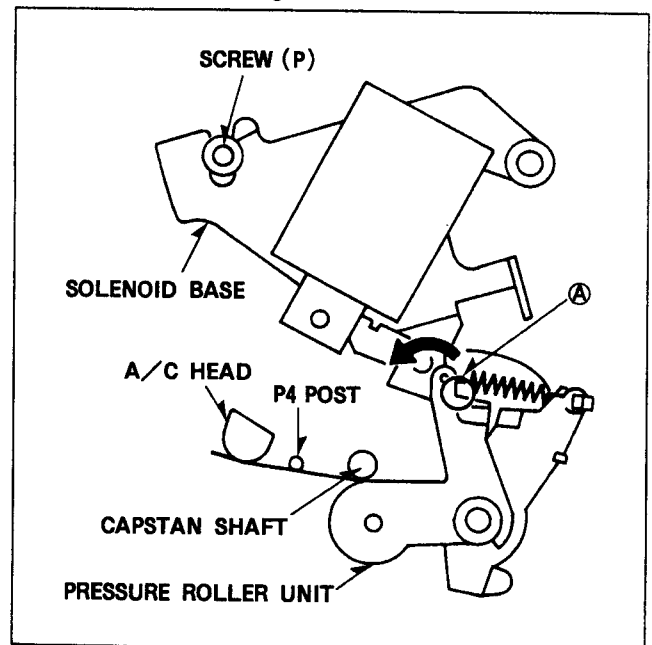


Figure M22-B

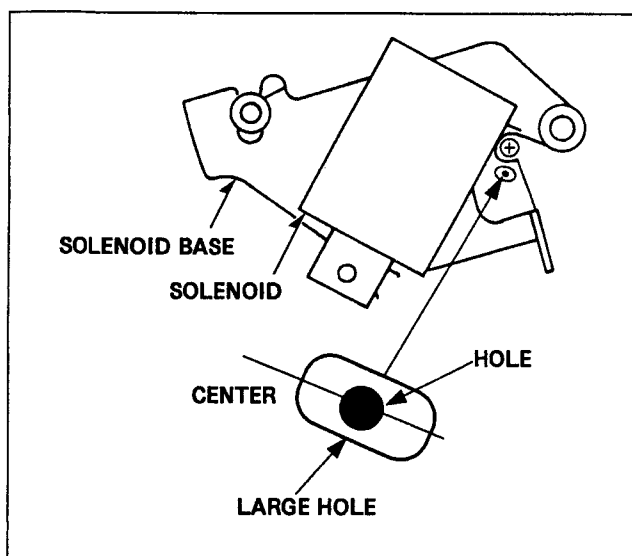


Figure M22-C

Note: Pressure Adjustment of the Pinch Roller (Refer to Mechanical Adjustment procedures) should be performed after completion of reinstalling the Pinch Solenoid.

3-5-14. REPLACEMENT OF THE HEAD CLEANING PAD

1. Remove a Cut Washer (N) and the Head Cleaning Pad Unit.
2. The Head Cleaning Pad Unit can be reinstalled by reversing the removal procedure.

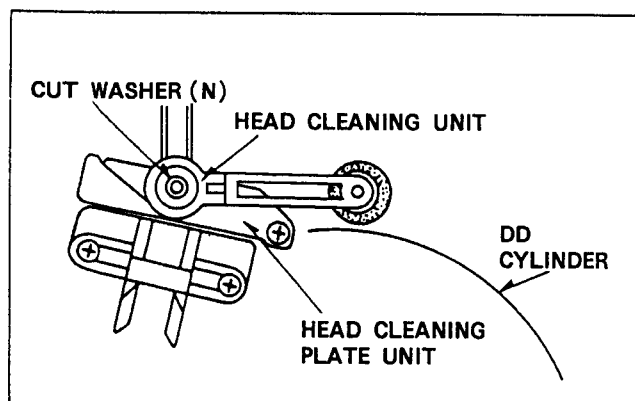
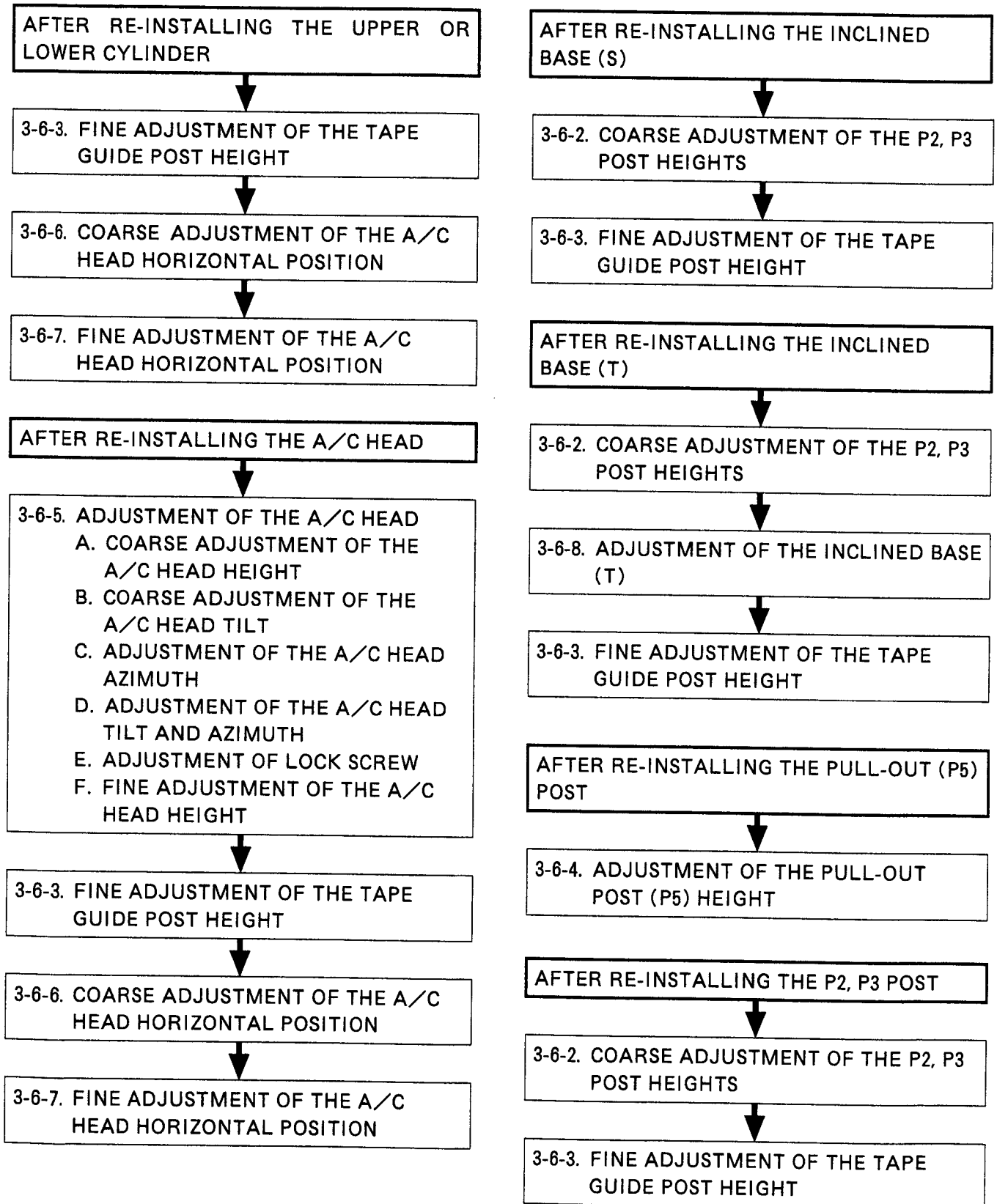


Figure M23

3-6. MECHANICAL ADJUSTMENT PROCEDURES

3-6-1. FLOW CHART OF TAPE INTERCHANGEABILITY ADJUSTMENT

3
MECHANISM



3-6-2. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS (P2 and P3)

Note: The Tape Guide Posts have been precisely adjusted at the factory. Therefore, normally do not change the height of the P2 and P3 Posts.
To prevent the alignment tape from being damaged, use a normal cassette tape for this procedure.

<<TOOL>>

Post Adjustment Plate	:	VFK0191
Reel Table Height Gauge	:	VFK0190
Post Adjustment Screwdriver	:	VFK0329
Check Light	:	VFK0948
L Type Screwdriver	:	VFK0269

1. Remove the cassette compartment (Refer to Disassembly Procedures).
2. Place the Post Adjustment Plate over the reel tables. Confirm that the Post Adjustment Plate is firmly seated as shown in Figure M25-A.

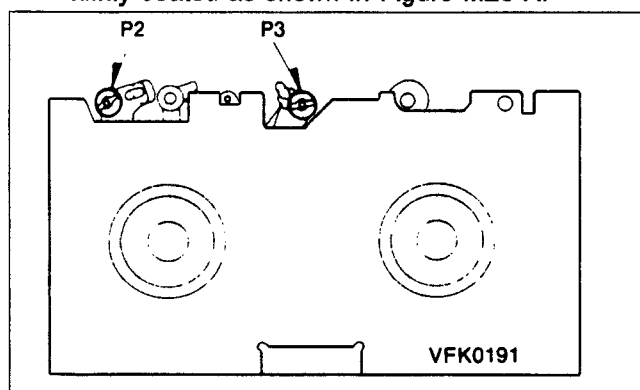


Figure M25-A

3. Lower 2 tape guide posts (P2 and P3) by turning the Post Adjustment screwdriver so that the condition of post becomes as shown in Figure M25-B. That is the lower edge of Tape guide should be lower than surface of Adjustment Plate.

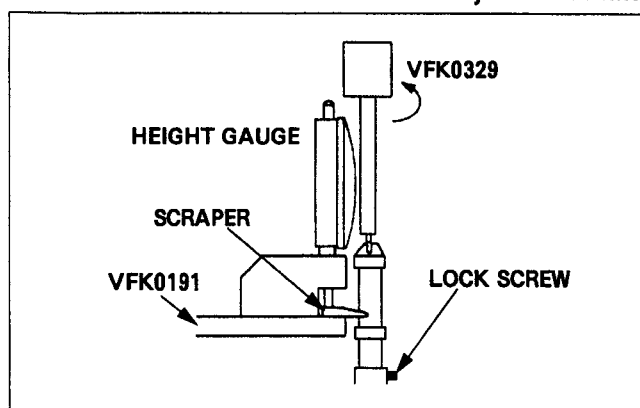


Figure M25-B

Note: Before turning P2 and P3 slightly loosen the Lock Screw using the L Type Screwdriver.

4. Place the scraper of Reel Table height Gauge as shown in Figure M25-C. Set the gauge to zero, then raise the post slowly until the lower tape guide just touches the bottom of the scraper. Use the gauge to determine the exact point at which the lower tape guide touches the scraper.

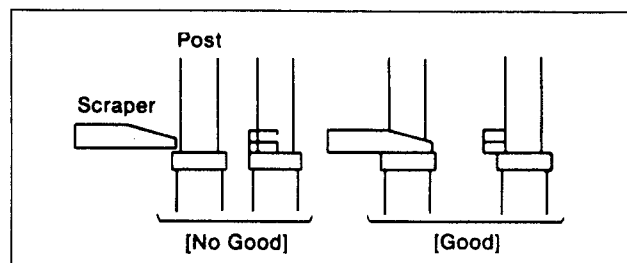


Figure M25-C

5. After the adjustment, install the cassette compartment referring to Reinstallation of cassette compartment.
6. Play back the beginning portion of NV-T160 cassette tape, and confirm that tape travel as shown in Figure M25-D.

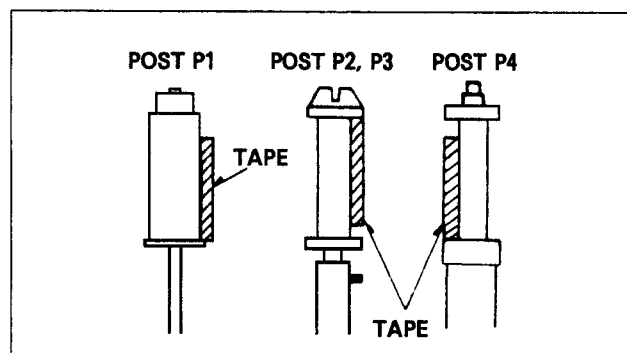


Figure M25-D

7. Make sure that the edges of the tape are not curling or waving at the bottom or top end of the posts P2, P3 by using the Check Light.
8. If there are waving or filling at the lower or upper edge of the P2 and P3 posts, readjust the heights of P2 and P3 Posts correctly as shown in Figure M25-E.

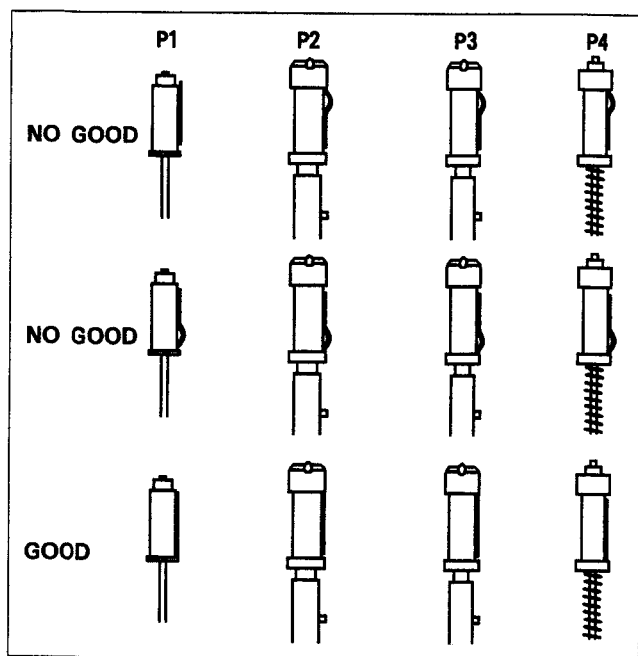


Figure M25-E

9. And confirm that the tape runs along the Cylinder Lead Correctly.

3-6-3. FINE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHT (P2 and P3)(LINEARITY)

<<TOOL>>

Alignment Tape ; VFM8180HADH
Post Adjustment Screwdriver ; VFK0329

Note: Before playing back the alignment tape playback a normal cassette tape and confirm correct transport.

1. Connect the oscilloscope to the TP6 of the Video 1 C.B.A. (Video RF Envelope and the head switching pulse as a triggering signal).
2. Play back the 2-nd portion (Monoscope 2) of the alignment tape (VFM8180HADH).

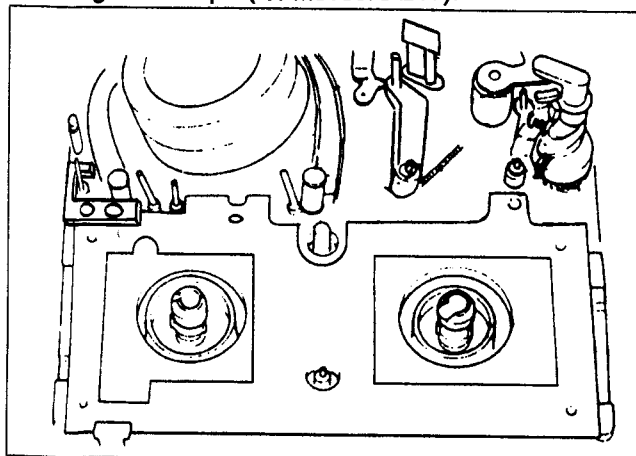


Figure M26-A

3. Press the tracking control button on the front panel and adjust for maximum.
4. If the RF envelope appears like example A or B in Figure M26B then adjustment of the tape guide post (P2:Entrance) is necessary.
5. Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Figure M26B.

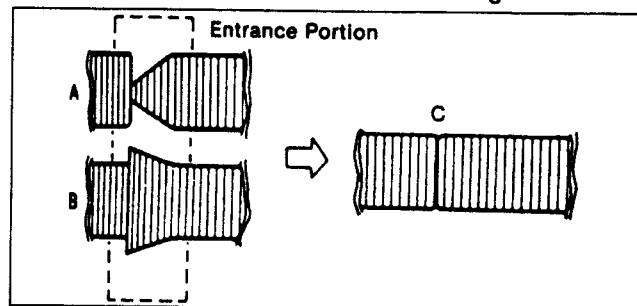


Figure M26-B

6. If the RF envelope appears like example D or E in Figure M26-C, then adjustment of the tape guide post (P3:Exit) is necessary.
7. Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Figure M26-C.

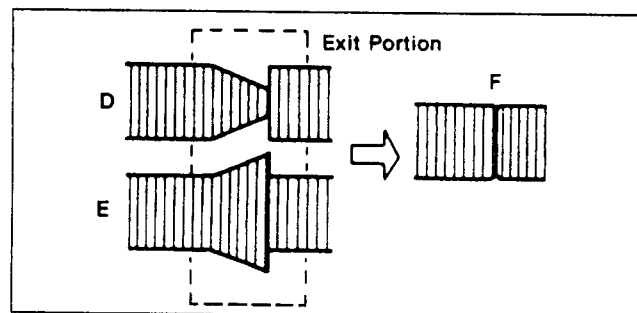


Figure M26-C

8. The output envelope should vary nearly parallel with other condition as shown in Figure M26-D.

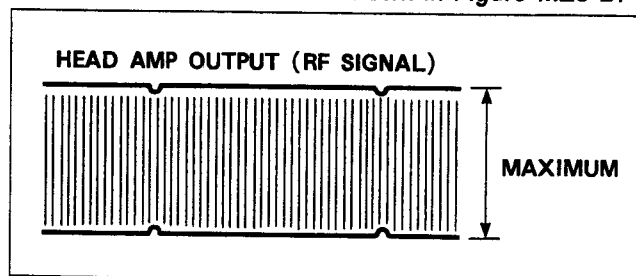


Figure M26-D

9. If the RF envelope does not meet these specification,

$$\frac{V1}{V0} \geq 0.7$$

$$\frac{V2}{V0} \geq 0.8$$

$$\frac{V3}{V0} \geq 0.7$$
 then repeat steps 4-9 again.

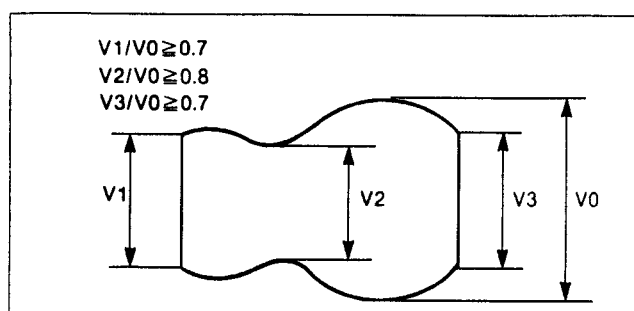


Figure M26-E

3-6-4. ADJUSTMENT OF THE PULL-OUT POST (P5) HEIGHT

<<TOOL>>

Post Adjustment ; VFK0191
 Reel Table Height Gauge ; VFK0190
 Nut Driver ; Purchase locally

<<SPEC>>

0.03mm ± 0.01mm

Note: Unless the replacement or adjustment this post is required, the adjustment nut should not be turned.

1. Remove the cassette compartment (Refer to Disassembly procedures).
2. Place the Post Adjustment Plate over the reel tables.
3. Turn the Worm Shaft counterclockwise (loading direction) until the mechanical condition becomes as shown in Figure M27-A.

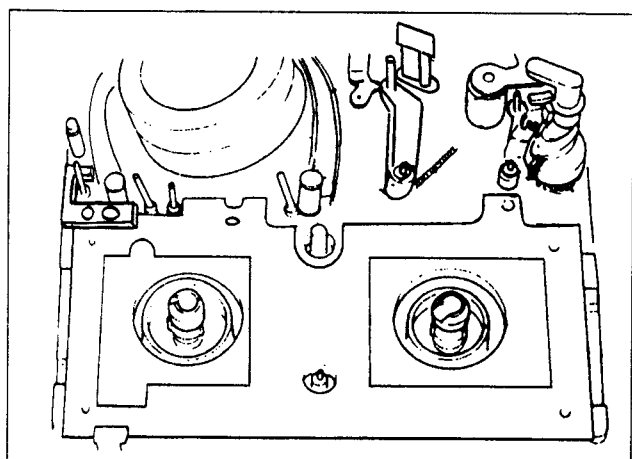


Figure M27-A

4. Place the Reel Table Height Gauge on the Post Adjustment Plate and set the gauge to zero 0 as shown in Figure M27-B.

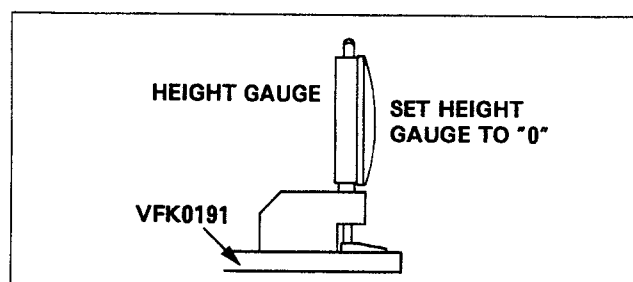


Figure M27-B

5. Place the Reel Table Height Gauge as shown in Figure M27-C and turn the nut slowly until the gauge reads.

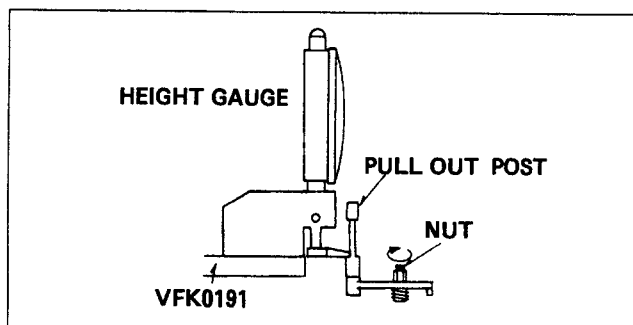


Figure M27-C

6. After the adjustment, install the cassette compartment (Refer to reinstallation of Cassette Compartment).
7. Play back a normal cassette tape on Review search mode, and make sure that the edges of the tape are not curling or waving at the bottom end of the P4 post by using the Check Light as shown in Figure M27-D.

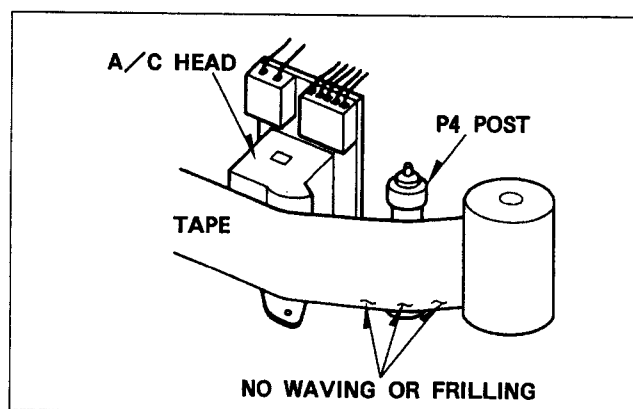


Figure M27-D

Note: There is easy method to check Waving of Filling. If there is Waving or Filling in the lower edge, the white black pattern which is reflected on the tape will curve or not linear as shown in Figure M27-E.

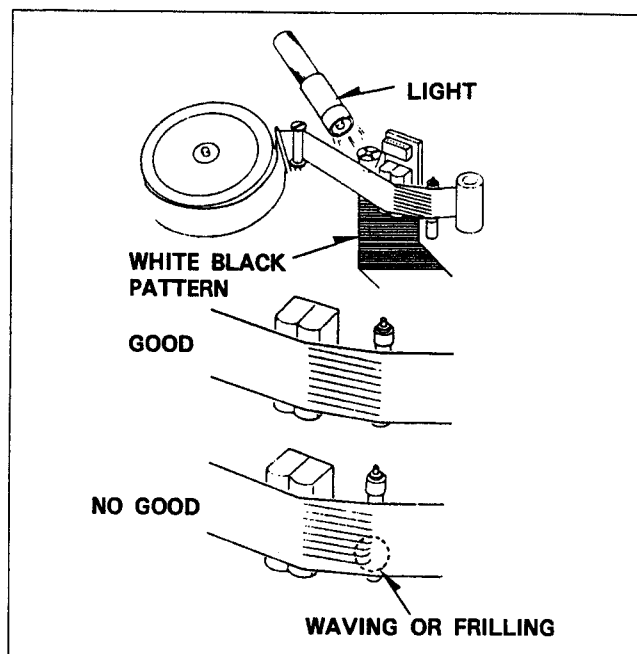


Figure M27-E

3-6-5. ADJUSTMENT OF A/C HEAD

A. COARSE ADJUSTMENT OF THE A/C HEAD HEIGHT

Note: This procedure should be performed only when the A/C Head is replaced.

<<TOOL>>

Check Light ; VFK0948
Nut Driver ; Purchase locally
VHS video Tape

1. With the tape running, look at the lower edge of the control head by using the check light.
2. Adjust the Nut (A) as shown in Figure M28-A by turning the Nut (A) clockwise to lower the head, and counterclockwise to raise it.

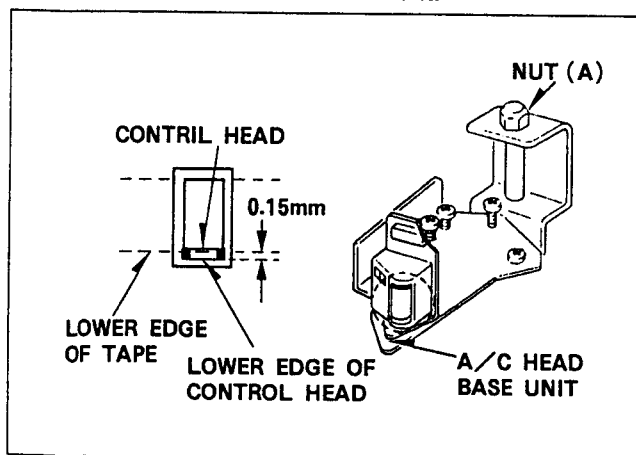


Figure M28-A

B. COARSE ADJUSTMENT OF THE A/C HEAD TILT

Note: This procedure should be performed only when the A/C Head is replaced or posts heights are readjusted.

<<TOOL>>

Alignment Tape ; VFM8180HADH
Check Light ; VFK0948
Screwdriver (+) ; Purchase locally
VHS Vide Tape

1. Play back a VHS video tape which the amount of tape winding of a Take up Reel, Turn a screw (B) to clockwise until waving or Filling appears in the Lower edge of P4 post as Figure M28-B.

Note: There is easy method to check waving or Filling if there is waving or Filling in the lower edge. ZEBRA pattern which is reflected on the tape will curve or not linear (Figure M27-E).

2. Turn the screw (B) to counter-clockwise until waving or filling do not appear in the in the lower edge of P4 post.

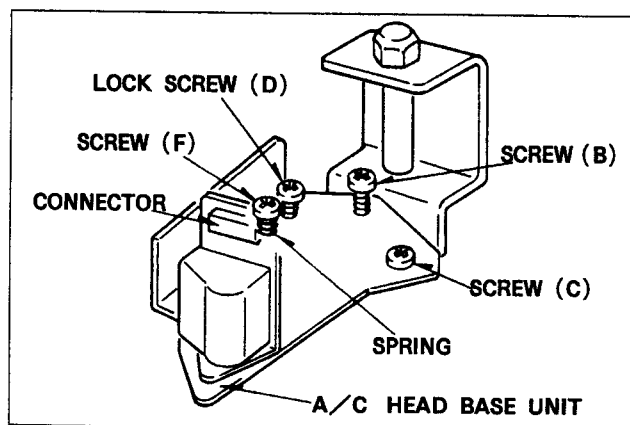


Figure M28-B

C. ADJUSTMENT OF A/C HEAD AZIMUTH

1. Connect the scope CH1 to test point (Normal Audio out put CH1) and the scope CH2 to test point (Normal Audio output CH2) on the Rear Jack.
2. Play back the 2-nd portion (Normal Audio 6KHz) of the alignment tape (VFM8180HADH).
3. Adjust the screw (C) so that these phases of both channels match as shown in Figure M28-C.

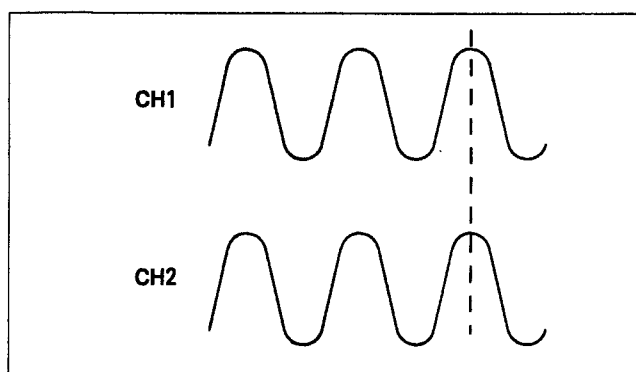


Figure M28-C

D. TILT and AZIMUTH ADJUSTMENT OF A/C HEAD

1. Adjust the screw (C) and (B) so that CH1 and CH2 output levels become maximum, these phase of both channels much at the same time (Figure M28-D). During this adjustment the Lock screw (D) dose not touch the A/C Head Base as shown in Figures M28-E.

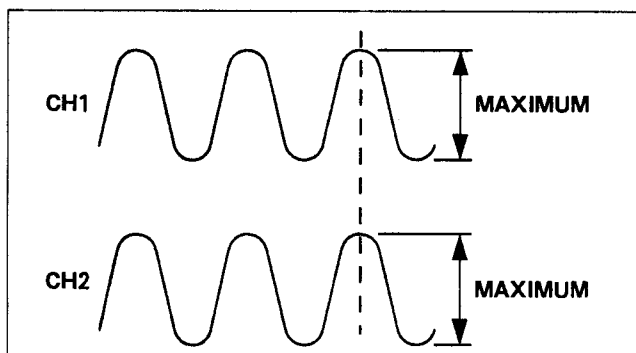


Figure M28-D

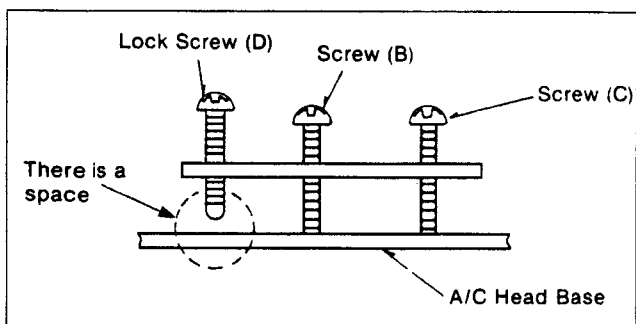


Figure M28-E

E. ADJUSTMENT OF LOCK SCREW

1. Turn the screw (C) to clockwise so that the difference of phase of both channels become 180 degrees as shown in Figure M28-F.
2. Tighten the Lock screw (D) so that these phase of both channels match as shown in Figure M28-F.

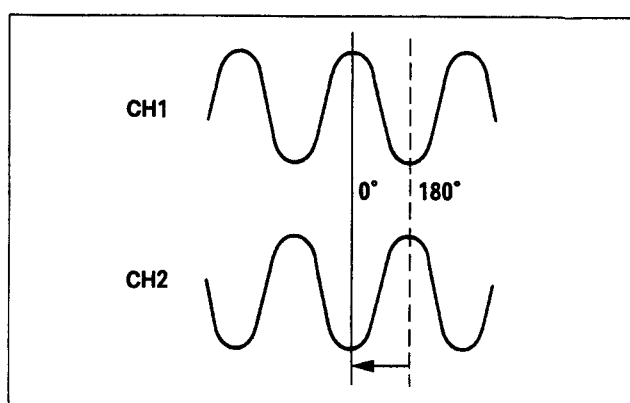


Figure M28-F

F. FINE ADJUSTMENT OF A/C HEAD HEIGHT

Note: Before this adjustment Coarse Adjustment of the A/C Head Height should be performed.

<<TOOL>>

Alignment Tape ; VFM8180HADH
Nut Driver ; Purchase locally

1. Connect a scope CH1 to test point (Normal Audio output CH1) and the scope CH2 to test point (Normal Audio output CH2) on the Rear Jack C.B.A.
2. Play back the 2-nd portion (Normal Audio 6KHz) of the Alignment Tape (VFM8180HADH)
3. Adjust the Nut (A)(Figure M28-A) so that the CH2 output level becomes maximum as shown in Figure M28-H.

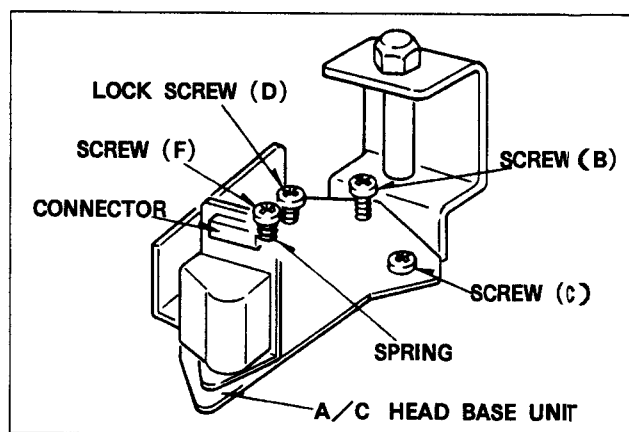


Figure M28-G

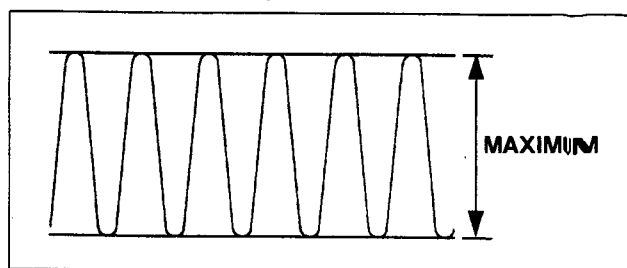


Figure M28-H

3-6-6. COARSE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE)

Note: This procedure should be performed only when the A/C head is replaced, and after performing the tape interchangeability adjustment.

<<TOOL>>

H-Position Adjustment Screwdriver; VFK0328
Alignment Tape ; VFM8180HADH

1. Connect a scope CH1 to Video RF Test Terminal (TP6 of the Video 1 C.B.A.) and a scope CH2 to Normal Audio CH2 output on the Rear Jack.
2. Playback the 1 position (Monoscope 1 and Audio/Every 10-the field is skipped) of the Alignment tape VFM8180HADH.
3. Adjust the A/C head horizontal position screw so that the phase of audio drop out and video RF envelope drop-out becomes the same as shown in Figure M29

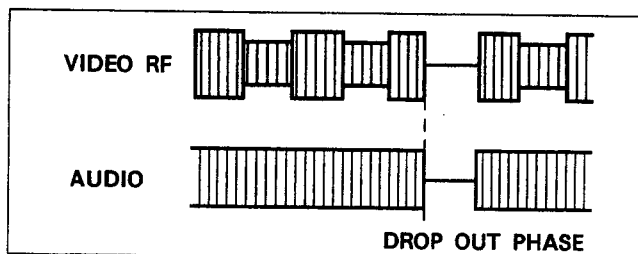


Figure M29

Note: After completion the fine adjustment of the A/C head horizontal position, the phase of Audio drop-out and Video RF envelope drop-out may be changed slightly.

3-6-7. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE)

Note: This procedure should be performed only when the A/C head is replaced, and after performing the tape interchangeability adjustment.

<<TOOL>>

H-Position Adjustment Screwdriver ; VFK0328
Alignment Tape ; VFM8180HADH

1. Press the tracking control button "+" and "-" at same time to the center position.
2. Connect a oscilloscope to Video RF test Terminal.
3. Play back the 2-nd portion (Monoscope 2) of the alignment tape (VFM8180HADH).
4. Adjust the Horizontal Position Screw (Figure M29) of A/C head so that the RF signal becomes maximum level as shown in Figure M30.

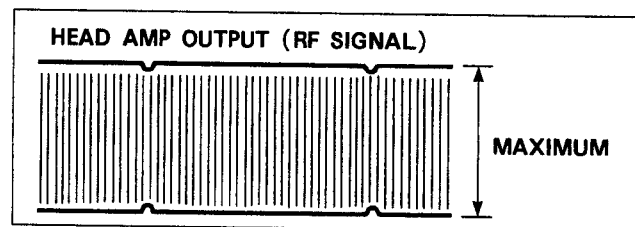


Figure M30

3-6-8. ADJUSTMENT OF INCLINED BASE (T)

<<TOOL>>

Check Light ; VFM0948
Screwdriver (+) ; Purchase
VHS Video Tape

1. Play back the beginning portion of 180 minute normal cassette tape and confirm that waving or filling of P3 post is as shown in Figure M31-A

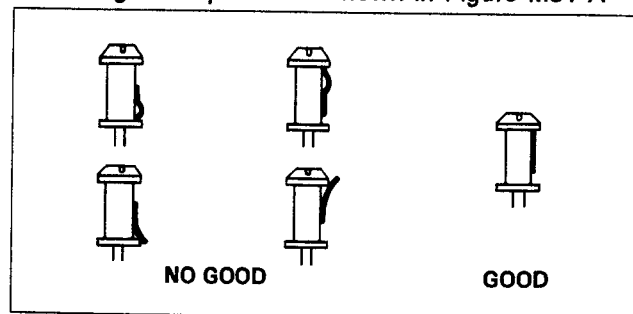


Figure M31-A

2. If there are waving at the lower and upper edge of the P3 post, Adjustment the inclined base of P3 post as shown in Figure M31-B.

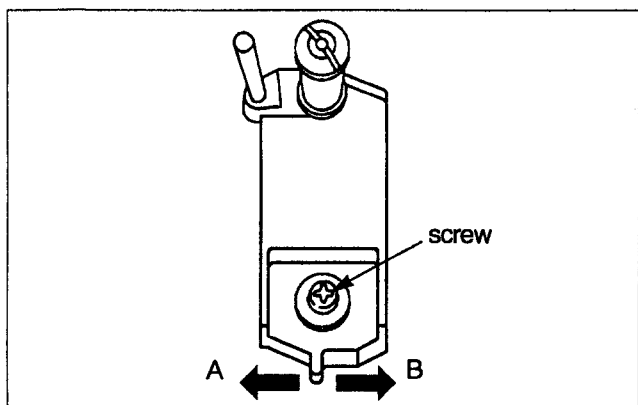


Figure M31-B

[When the inclined base is adjust to an arrow direction (B) tape becomes to lower edge.]

3. Confirm that tape position P3 post is upper edge and then tighten screw as shown in Figure M31-B.
4. Confirm that waving is occurred between upper side of P3 post and A/C head. If there is waving adjust the step 2.

Note: After adjust inclined base tape interchangeability and A/C head adjustment must be required.

3-6-9. ADJUSTMENT OF THRUST GAP

1. Turn the thrust adjustment screw clockwise to until the capstan rotor just separate from the capstan stator whit rotating the capstan rotor by hand.
2. Turn the thrust adjustment screw clockwise to 180 degrees from paint at step 1.
3. Set the 2 oil seal to edge of the capstan housing as shown in Figure M32.

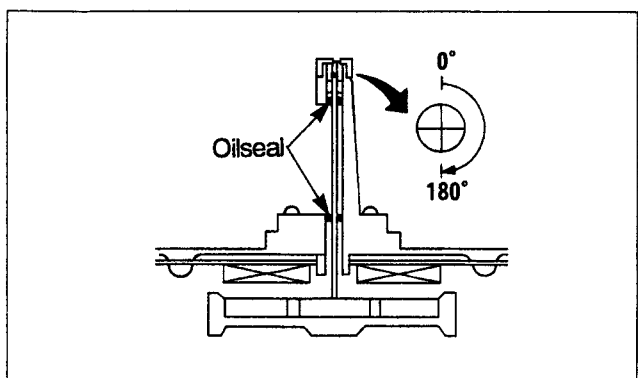


Figure M32

3-6-10. ADJUSTMENT OF FG GAP

<<TOOL>>

Fine Adj. screwdriver : VFK0330
Screwdriver : Purchase locally

<<SPEC>> 0.16mm ± 0.04mm

1. Loosen screw (Q) and set the Fine Adjustment screw driver n the hole on the Capstan Stator Unit.
2. Adjust the gap between FG head and the Capstan Stator unit.
3. After adjustment tighten a screw (Q).

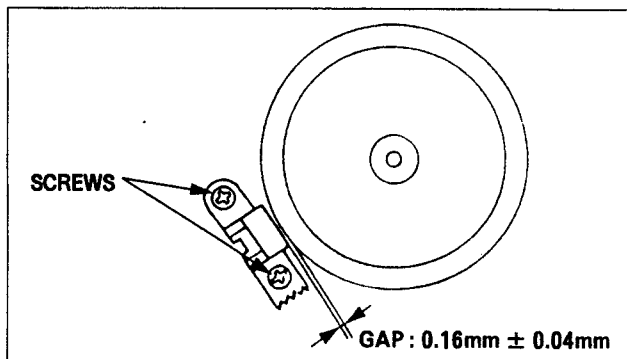


Figure M33-A

Note: After adjust FG head gap, FG output level confirmation must be required.
Do not touch the surface of rotor and keep any magnetizable material away.

CONFIRMATION OF FG OUTPUT LEVEL

1. Connect a oscilloscope to TP8009 (CAP FG output) on the Video 3 C.B.A.
2. Confirm that FG output level is within specification during PLAY/REC or PLAY mode.
3. If FG output level is out of specification. Readjust the step 1 ~ 3 of FG GAP Adjustment.

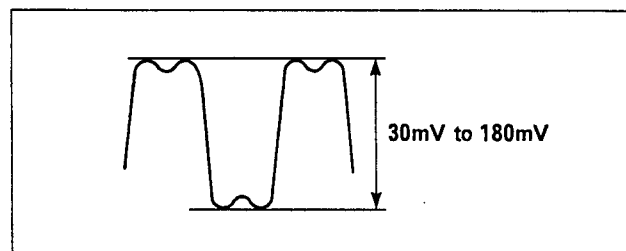


Figure M33-B

3-6-11. MEASUREMENT AND ADJUSTMENT OF BACK TENSION

<<TOOL>>

Back Tension Meter ; VFK0132

VHS Cassette Tape(120min. tape except S-VHS tape)

A. FWD TENSION ADJUSTMENT

<<SPEC>>

23g ~ 27g

1. Play back the cassette tape from the beginning and wait until the tape movement get the stabilization (for approx. 10 to 20 seconds).
2. Pull the Impedance Roller in the direction indicated the arrow in Figure M34-A secure it with a piece of adhesive tape.
3. Insert the Back Tension Meter into the path of a tape, and measure the back tension.

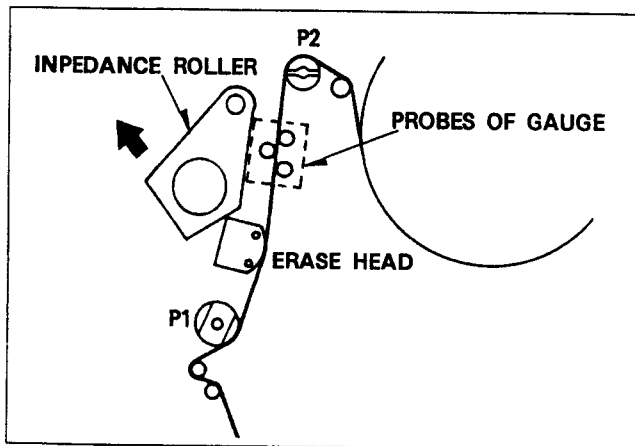


Figure M34-A Measurement of Back Tension

4. If it is out of specification, replace the Tension spring.

B. REV TENSION ADJUSTMENT

<<SPEC>>

30g ~ 60g

1. Play back the cassette tape on SP Reverse Play mode from the beginning and wait until the tape movement get the stabilization (for approx. 10 to 20 seconds).
2. Pull the Impedance Roller in the direction indicated by the arrow in Figure M34-B secure it with a piece of adhesive tape.
3. Insert the Back Tension Meter into the path of a tape, and measure the back tension.
4. If it is out of specification, replace the Tension spring.

Note: While measuring, make sure that the three probes of the meter are all in good contact with the tape.
As the tension meter is very sensitive, we recommend taking 3 separate readings.

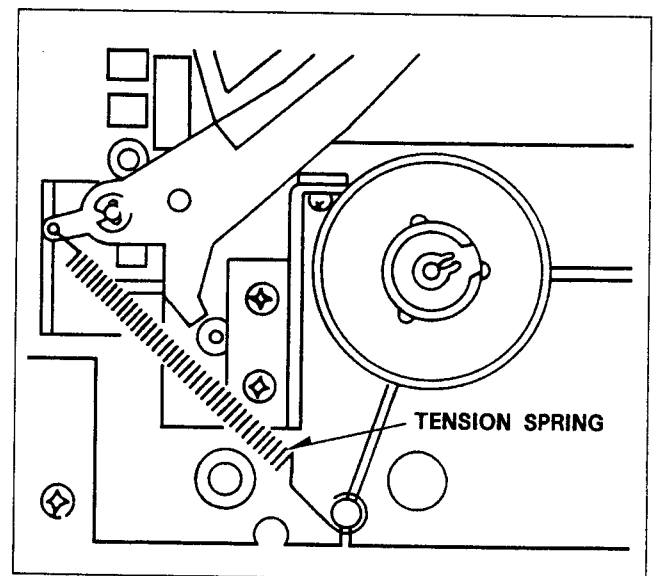


Figure M34-B

3-6-12. HEIGHT ADJUSTMENT OF THE REEL TABLES

<<TOOL>>

Post Adjustment Plate ; VFK0191
Reel Table Height Gauge ; VFK0190

<<SPEC>>

0 - 0.15mm

1. Remove the cassette compartment.
2. Place the post Adjustment Plate on the reel tables.
3. Place the Reel Table Height Gauge on the plate so that the scraper of the gauge touches the cut-out portion of the plate, then set the gauge to zero 0 as shown in Figure M35-A.

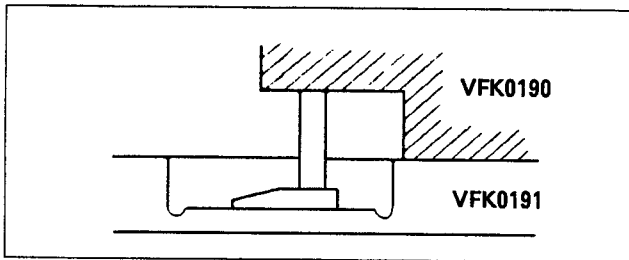


Figure M35-A

4. Measure the height of the top surface of either Reel table and note the difference in height from the plate cut-out (Figure M35-A and M35-B). Repeat this procedures for the other Reel Table.

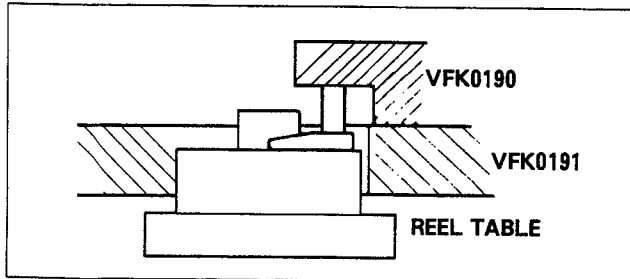


Figure M35-B

5. If the difference of Supply Reel table is more than 0.15mm higher or lower, replace the Supply Reel table. When the difference of Take Up Reel table is more than 0.15mm higher or lower, adjust nut (A)(Figure M35-C) so that measurement becomes the spec. If you can not adjust to the spec., replace Take Up Reel table.

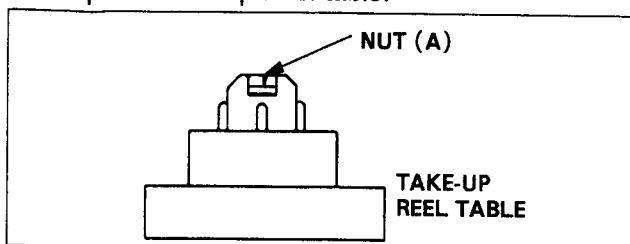


Figure M35-C

Note: When replacing the tables, the DD Reel Unit needs to be removed from the chassis. Remove 6 screws and carefully lift it out as shown in Figure M35-D.

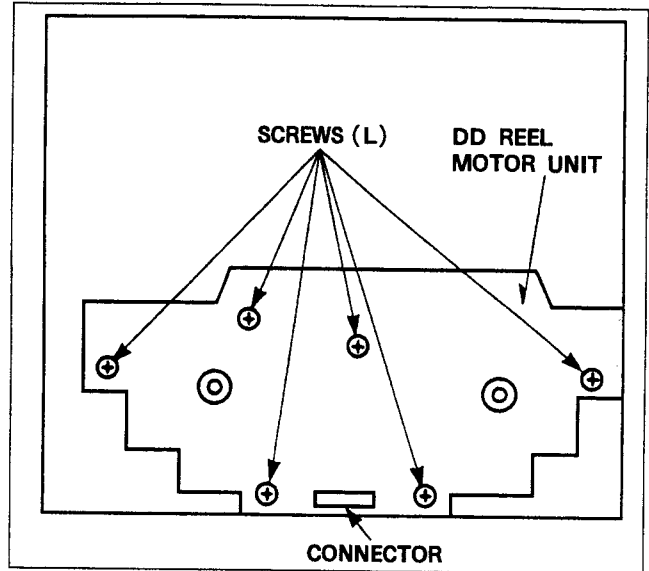


Figure M35-D Bottom View of DD Reel Unit

Note: When assembling the DD Reel Unit, slide a Main Rod to far left side by rotating the Center Gear, and then screw the 6 screws.

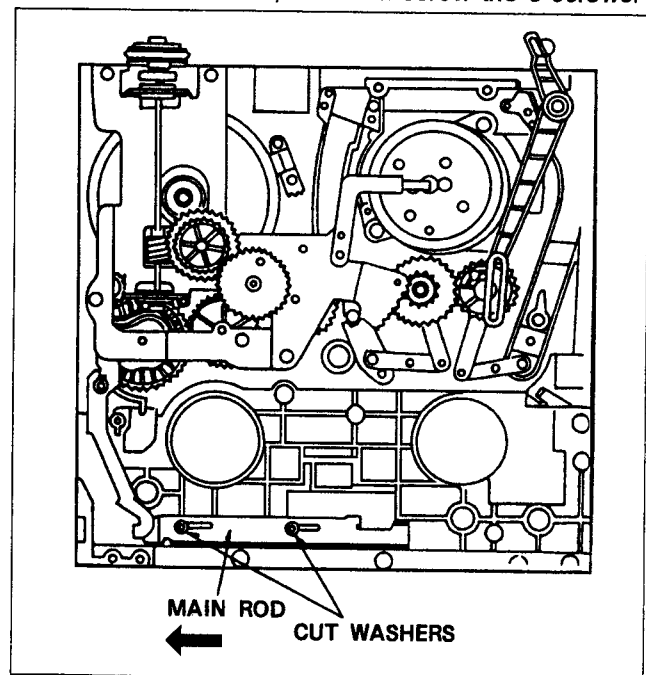


Figure M35-E

3-6-13. MEASUREMENT AND ADJUSTMENT OF THE BRAKE TORQUE

<<TOOL>>

Torque Gauge ; VFK0133
Adaptor for Gauge ; VFK0134

1. Remove the top cover and the cassette compartment.
2. Attach the adaptor to the torque gauge and place the deck in STOP mode (Sub loading mode).
3. Place the torque gauge on the reel table as shown in Figure M36-A. The weight of the gauge should not rest on the reel table.
4. Turn the torque gauge in the direction indicated in Figure M36-B until the brake begins slipping and read the gauge.

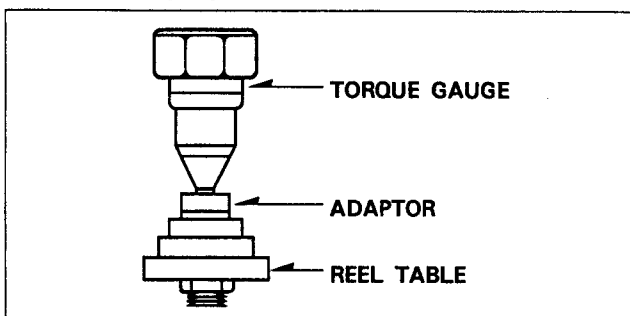
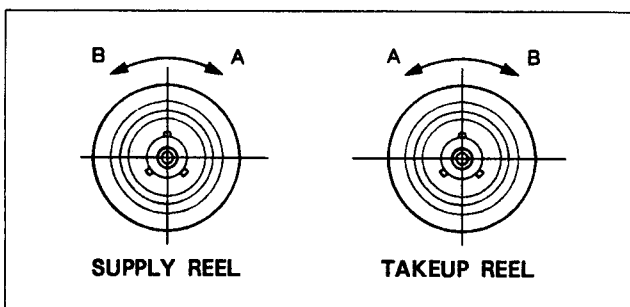


Figure M36-A Measuring Method



	A	B
Takeup	more than 550g-cm	more than 50g-cm
Supply	more than 550g-cm	more than 50g-cm

Figure M36-B Specification of Brake Torque

5. If it is out of specification, replace the Brake Spring.

Note: If the proper brake torque cannot be obtained by replacing the Brake Spring, clean the braking surface of the reel table with a soft cloth and re-measure the brake torque. If it is still out of specification, replace the Main Brake (S) or (T) Unit.

3-6-14. PRESSING FORCE CONFIRMATION OF PRESSURE ROLLER UNIT

<<TOOL>>

Fan Type Tension Gauge ; VFK66
VHS 120min, Cassette Tape

<<SPEC>>

1050g \pm 230g

1. Remove the Cassette Compartment.
2. Play back the end portion of VHS (180min.) tape.
3. Set the Fan Type Tension Gauge to the part (A) of Pinch Roller Unit.
4. Press the Arm with the Gauge, in the direction indicated by the arrow as shown in Figure M37.
5. Adjust the Solenoid Base so that the reading of the Tension Gauge is 1050g \pm 230g at the moment of the tape running stop.
6. If it is out of specification, replace the Tension spring.

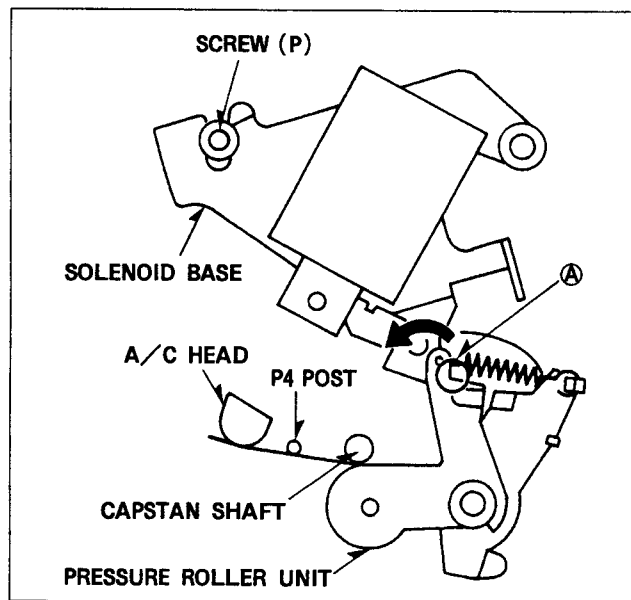


Figure M37

3-6-15. ADJUSTMENT OF REV TENSION SENSOR POSITION

<<TOOL>>

Tension Sensor Adj. Fixture	:	VFK0806
Tension Post Adj. Plate	:	VFK0236
Fine Adj. Screwdriver	:	VFK0330
Digital Volt Meter	:	Purchase locally

<<SPEC>>

2.3V ~ 2.7V

Note: Assemble a Tension Sensor Adjustment Fixture (VFK0806) and a Tension Post Adj. Plate (VFK0236) as shown in Figure M38-A.

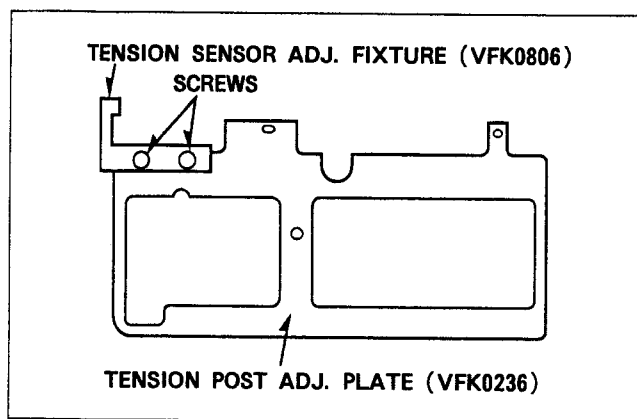


Figure M38-A

1. Remove the Top Plate and Cassette Holder Unit. (refer to Disassemble Procedures)
2. Disconnect the 4pin and 2pin flat wire to the pin3 and 4 of the connector P1508.
3. Connect two wires of 4pin flat wire to the pin3 and 4 of the connector P1508.
4. Push the Sub Wiper Arm (R) to direction of Cassette loading. Then the Sub Wiper Arm (R) goes down it self and mode of machine change to STOP.
5. Turn the Power switch off.
6. Remove the Cassette Compartment (refer to Disassembly Procedures).
7. Connect the V.T.V.M. or D.V.M. to TP8008 on the Video 3 C.B.A.
8. Place the Tension Post Position Adjustment Plate with the Fixture over the reel tables as shown in Figure M38-B.

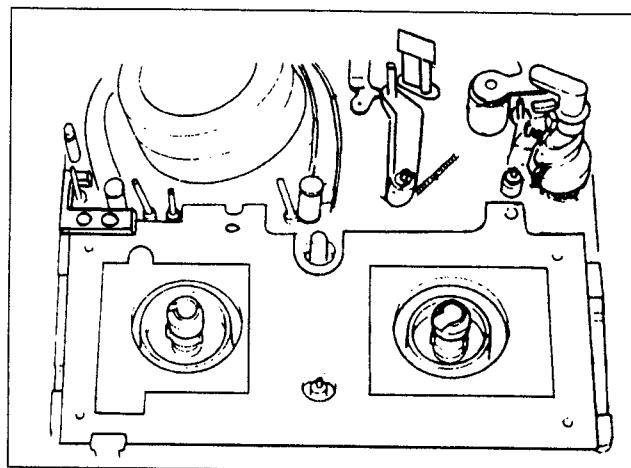


Figure M38-B

9. Turn the Power switch on.
10. Slightly loosen 2 screws (C). Insert a Fine Adj. Screwdriver in the hole (D) (Figure M38-C).

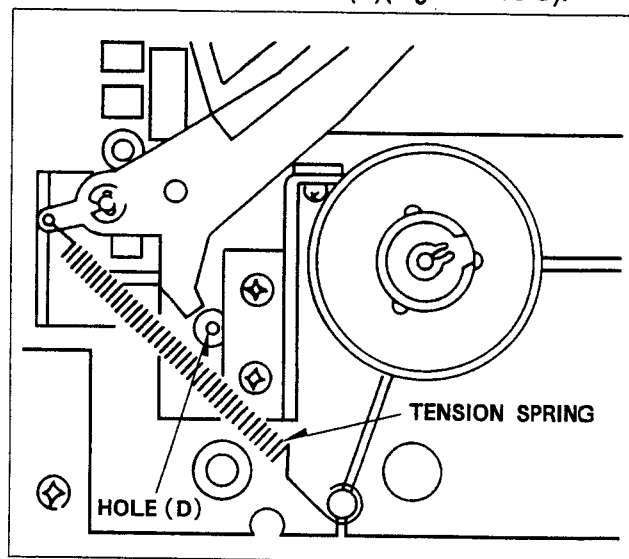


Figure M38-C

11. Press the PLAY button.
12. Adjust the Rev Sensor Position so that measurement becomes D.C. 2.3V ~ 2.7V.
13. Tighten the 2 Screws (C).
14. Remove the Tension Sensor Fixture.
15. Reinstall the Cassette Compartment.
16. Confirm Playback picture (Rev Playback mode, Playback mode etc.)

3-7. ASSEMBLY AND ADJUSTMENT PROCEDURES OF MECHANISM

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch. Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on. If these parts are not fixed properly, the unit will be unloaded or compulsorily stopped. And it will result being damaged at any mechanical or electrical parts. The overall mechanical condition (alignment) of bottom and top view are shown in Figure M39-A and Figure M39-B. This mechanical adjustment is performed in the STOP mode.

4. Identification hole on the Mode Select Switch at 6 o'clock position and aligned with small hole on Pinch Cam as shown in Figure M39-B.
5. P5 Arm is completely loading position and the Inclined Base (S) and (T) are completely unloading position.
6. Small hole on Sub Cam Gear should align with small hole on the Connection Gear and rectangular mark on the Connection Gear should be at a 3 o'clock position.
7. Pressure Roller Unit is UP position.

3-7-1. CONFIRMATION OF ALIGNMENT CONDITION

1. Remove the Loading Belt.
2. Unscrew 4 screws (F) and remove the Gear Base Unit. (Figure M39-A)
3. Turn the Center Gear to counter-clockwise until 2 big holes of Center Gear align with 2 big holes of Retainer Gear and Ring Gear and Chassis as shown in Figure M39-C.

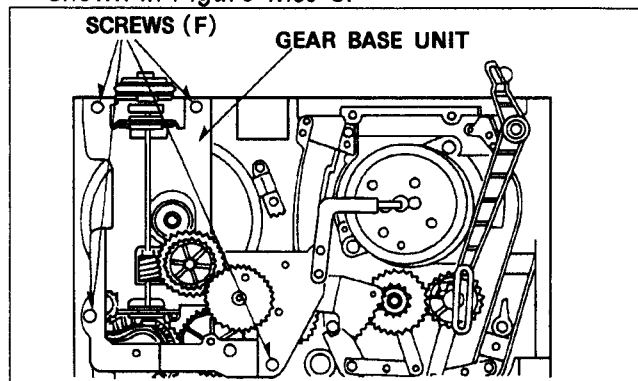


Figure M39-A

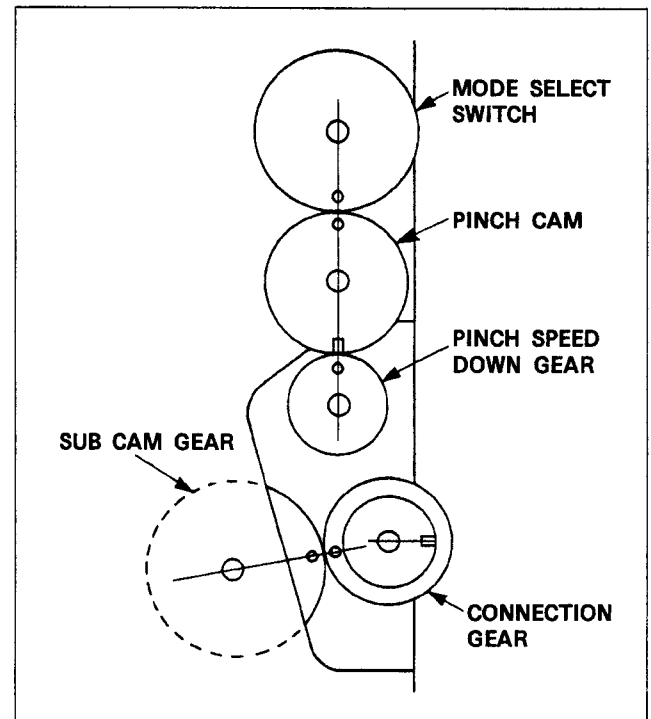


Figure M39-B Top View of Overall IQ-Mechanical Condition

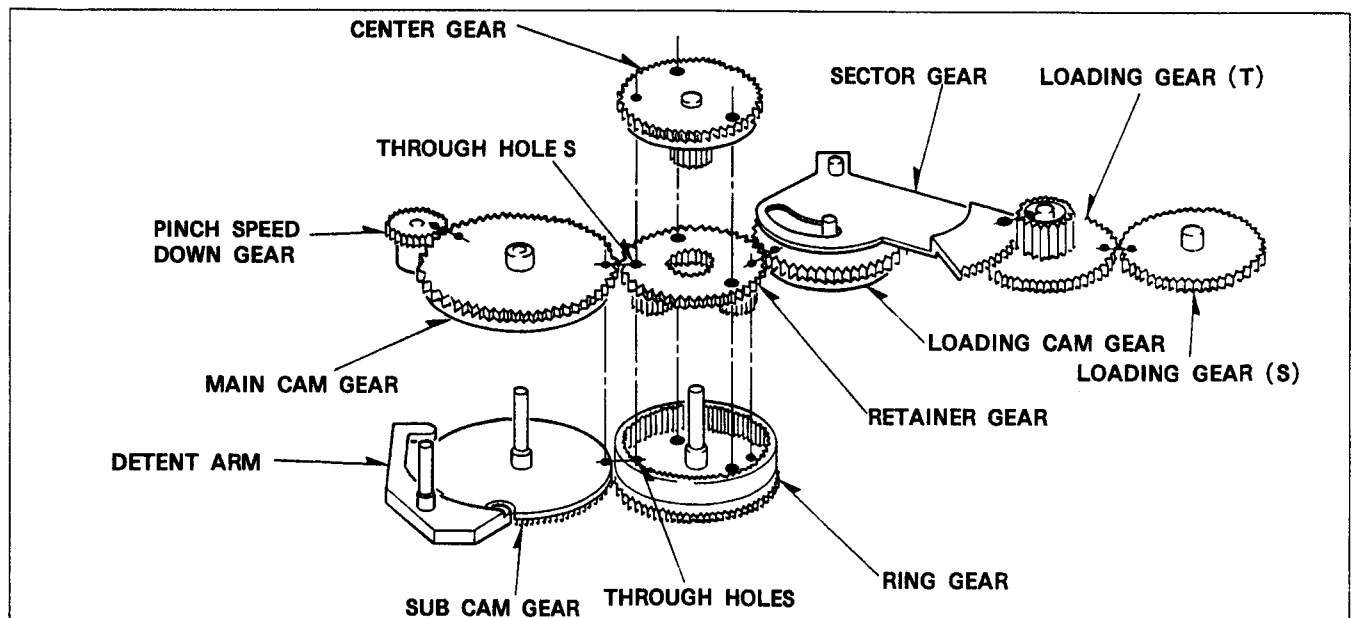


Figure M39-C Bottom View of Overall Mechanical Condition

3-7-2. ASSEMBLY PROCEDURES OF SUB CAM GEAR RING GEAR AND DETENT ARM

1. Install the Ring Gear so that the two holes on the Ring Gear align with the two holes on the chassis as shown in Figure M40.
2. Install the Sub Cam Gear so that the large hole on Sub Cam Gear aligns with the hole on chassis.
Also the small hole (located just outside of large hole) on Sub Cam Gear should align with the hole on Ring Gear as shown in Figure M40.
3. Confirm that the small hole on Sub Cam Gear is aligned with the small hole on Connection Gear as shown in Figure M39-B (In case of the Connection Gear is already installed).
4. Install the Detent Arm and make sure Detent Arm seats perfectly in detent of Sub Cam Gear as shown in Figure M40.

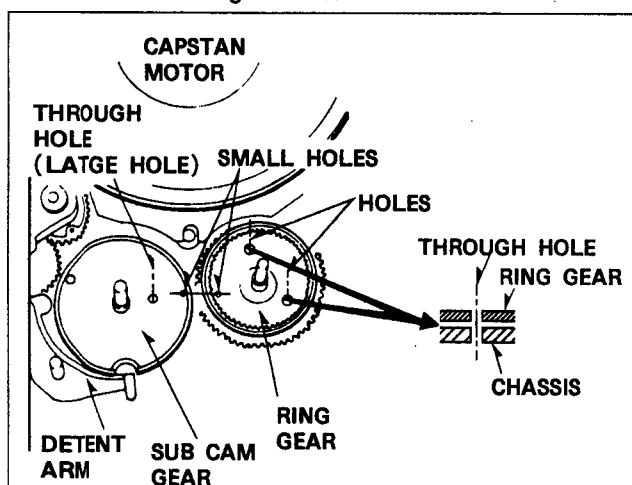


Figure M40

3-7-3. ASSEMBLY PROCEDURES OF MAIN CAM GEAR AND PINCH SPEED DOWN GEAR

1. Install the Main Cam Gear on to the Sub Cam Gear so that the small hole on the Main Cam Gear aligns with small hole on the Ring Gear as shown in Figure M41.
2. Insert a retaining ring.
3. Install the Pinch Speed Down Gear from top side of chassis so that the small hole on the Main Cam Gear as shown in Figure M41.

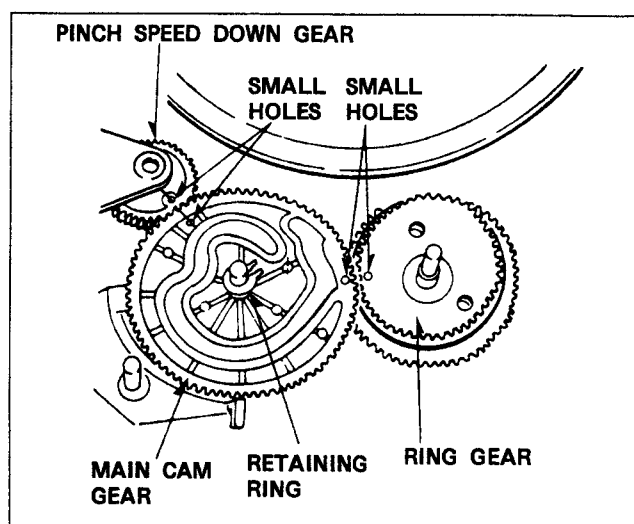


Figure M41

3-7-4. ASSEMBLY PROCEDURES OF LOADING CAM GEAR AND RETAINER GEAR

1. Install the Retainer Gear onto the Ring Gear so that the two holes on the Retainer Gear align with the two holes on the Ring Gear, at this time, small hole on the Main Cam Gear should align with small hole on the Retainer Gear as shown in Figure M42.
2. Install the Loading Cam Gear so that the small hole which is directly outside of the large hole on the Loading Cam Gear is aligned with the outside hole of the Retainer Gear as shown in Figure M42.

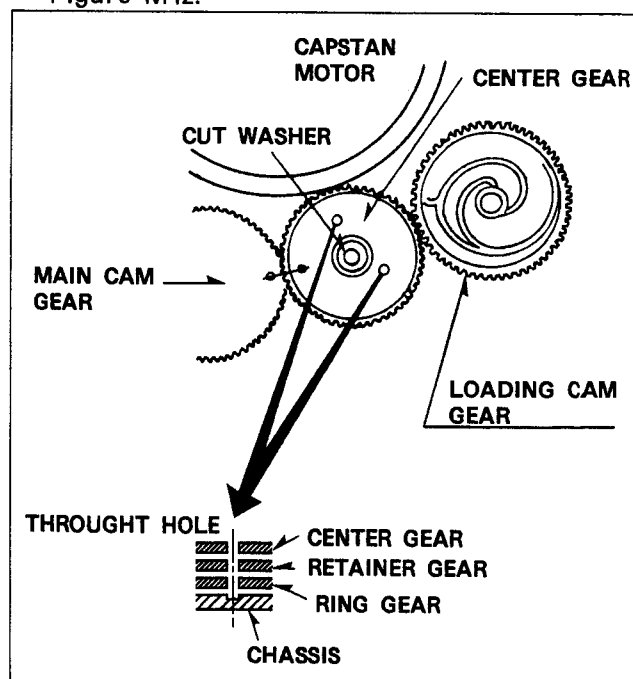


Figure M42

3-7-5. ASSEMBLY PROCEDURES OF CENTER GEAR

1. Softly Install the Center Gear onto the Retainer Gear so that the two holes in the Center Gear align with the holes on the Retainer Gear, then install the cut washer as shown in Figure M43.

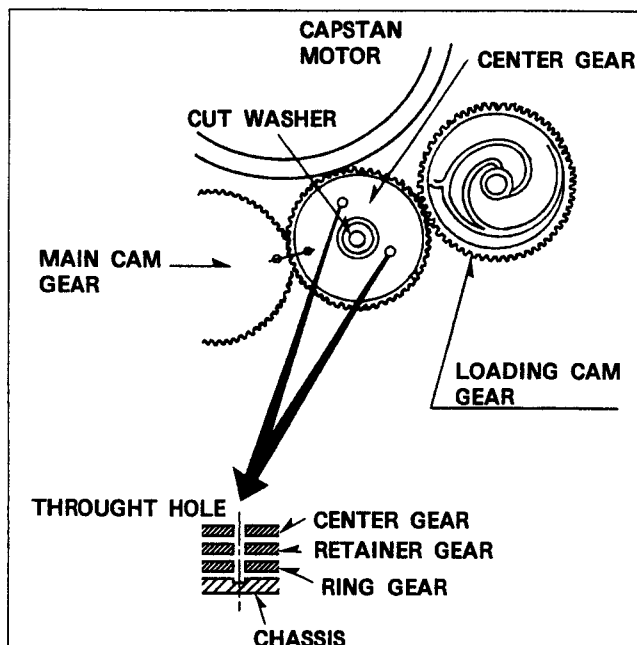


Figure M43

3-7-6. ASSEMBLY PROCEDURES OF MAIN LEVER AND CAM FOLLOWER ARM UNIT

1. Install the Main Rod and then insert the cut washers as shown in Figure M44.
2. Install the Cam Follower Arm so that the pin of the Cam Follower Arm inserts into the groove of the Main Cam Gear and also inserts into the slot on the Main Rod, insert the retaining ring.

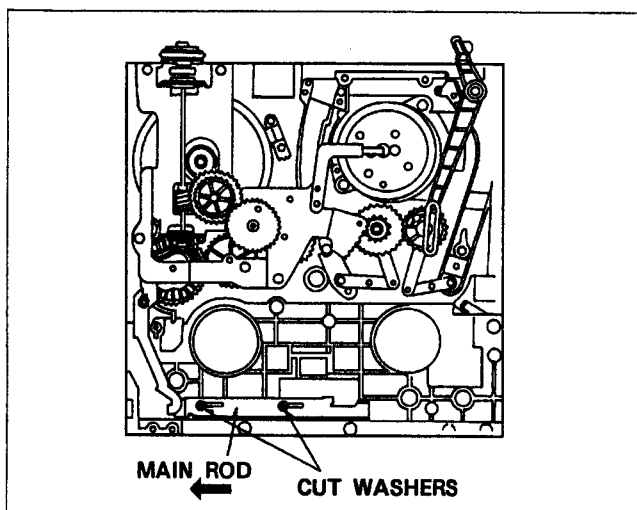


Figure M44

3-7-7. ASSEMBLY PROCEDURES OF LOADING GEAR (T), LOADING GEAR (S) SECTOR GEAR

1. Set the P2 and P3 posts to fully unloaded position, then install the Loading Gear (T) and (S) so that the outer hole on the Loading Gear (T) aligns with the outer hole on the Loading Gear (S) as shown in Figure M45-A.
2. Install the Sector Gear so that the outer hole in the Sector Gear aligns with the projection mark on Loading Gear (T).
3. Insert 3 retaining rings as shown in Figure M45-B.

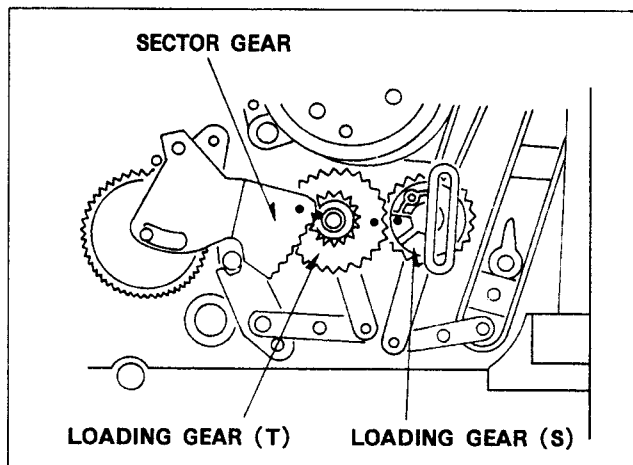


Figure M45-A

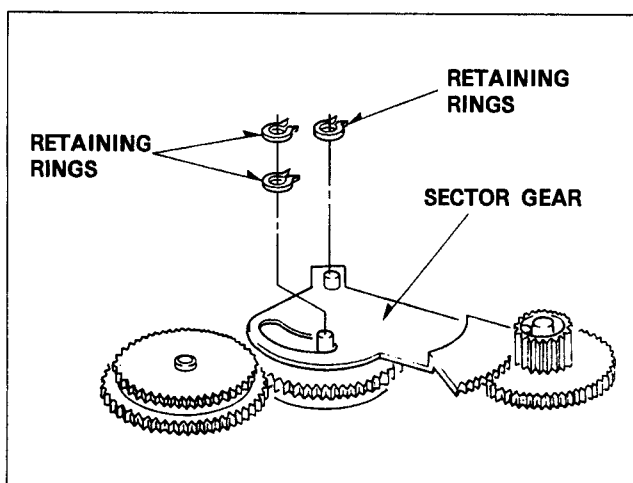


Figure M45-B

3-7-8. ASSEMBLY PROCEDURES OF CONNECTION GEAR

Note: Before assembling, Sub Cam Gear position (and positions of bottom side gears) must be correct as described before (Figure M39-B).

1. Install the Connection Gear so that the small hole on the Connection Gear aligns with the small hole on the Sub Cam Gear as shown in Figure M46.

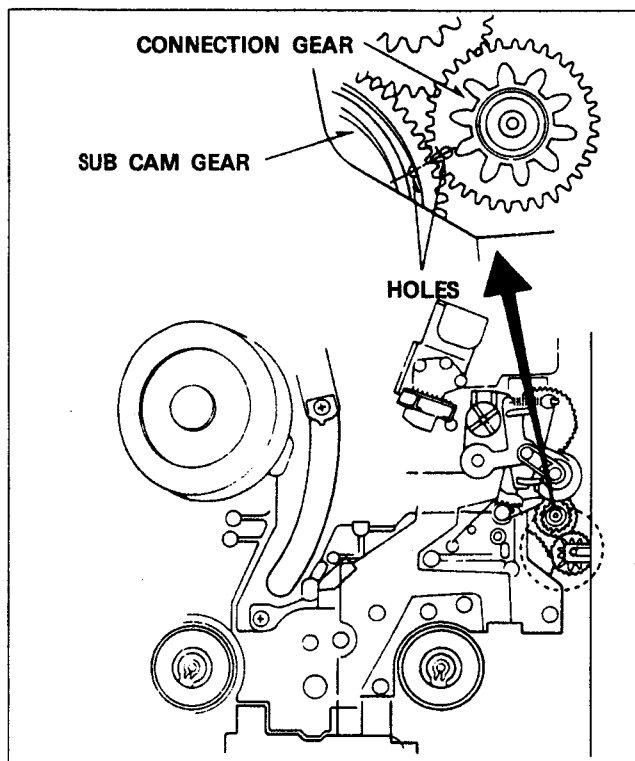


Figure M46

3-7-9. ASSEMBLY PROCEDURES OF MODE SWITCH AND P5 PULL OUT SECTOR GEAR

1. Turn the Center Gear to unloading position.
2. Install the mode Select Switch and tighten the mounting screw, then solder the 5 soldering portions.
3. Install the P5 Pull Out Sector Gear so that the hole of P5 Pull Out Sector Gear aligns with the tip of gear at P5 Arm as shown in Figure M47.

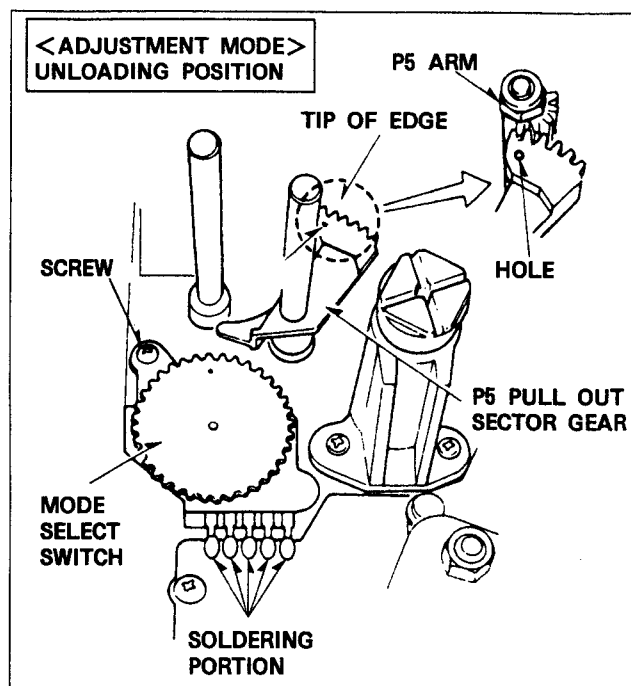


Figure M47

3-7-10. ASSEMBLY PROCEDURES OF PINCH CAM AND PRESSURE ROLLER UNIT

1. Install the Pinch Cam while pushing the P5 post forward. The gear of the Pinch Cam should drop to a seated position. In this position make sure hole in the Mode Select Switch aligns with small hole on the Pinch Cam, also the small rift on the Pinch Cam should align with the hole on the Pinch Speed Down Gear as shown in Figure M48.
2. Install the Pressure Roller Unit. Make sure the seats perfectly onto the Pinch Cam, then install the Pinch Cam Cap.

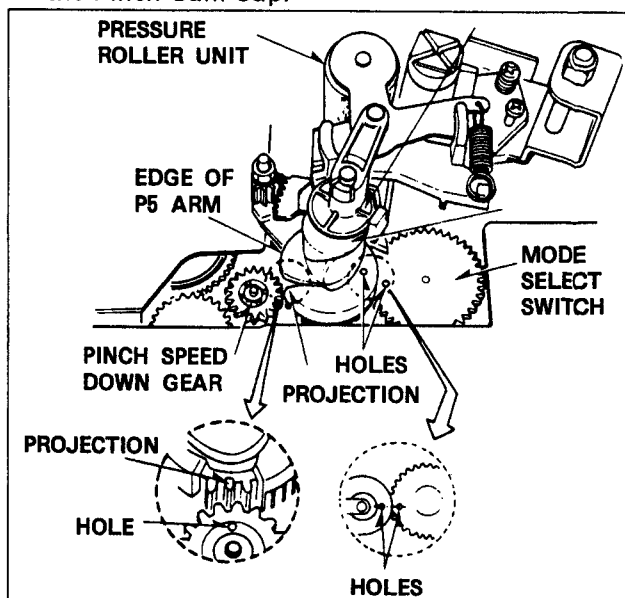


Figure M48

3-7-11. ASSEMBLY PROCEDURES OF GEAR BASE UNIT

1. Install the Gear Base Unit and screw 4 screws (F) as shown in Figure M49.

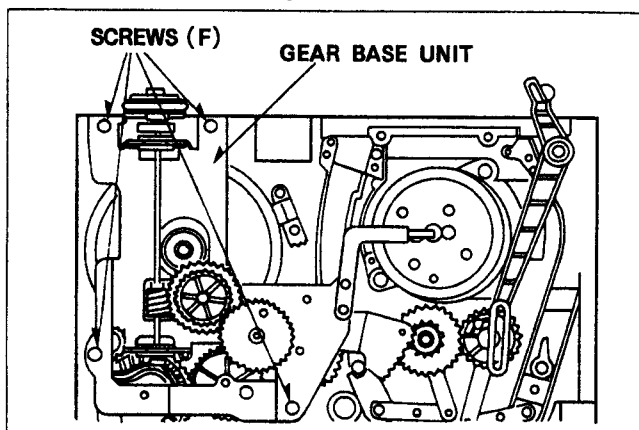


Figure M49

Note: The Gear Base Unit has 2 gears and worm shaft. There is no adjustment for these gears.

3-6-12. REINSTALLATION OF CASSETTE COMPARTMENT

When you reinstall the cassette compartment, the position adjustment of mechanism is necessary for correct operation, as follows.

A. Confirmation of STOP Alignment Condition

1. Turn the Worm shaft counter-clockwise or clockwise until mechanism is placed into the Alignment Condition as following conditions.
 - a) Identification hole on the Mode Select Switch at 6 o'clock position and aligned with small hole on Pinch Cam. (Figure M48)
 - b) P5 Arm is completely loading position and the Inclined Base (S) and (T) are completely unloading position.
 - c) Small hole on Sub Cam Gear should align with small hole on the Connection Gear (Figure M46) and rectangular mark on the Connection Gear should be at a 3 o'clock position.
 - d) Pressure Roller Unit is UP position.

B. Confirmation of Cassette Compartment

1. Confirm that the Cassette Compartment is aligned properly. In the EJECT position (Cassette Holder up and advanced to the front) the two V-shaped marks on the slide switch should align. The slide switch is located on the right side of the Cassette Assembly towards the rear as shown in Figure M50A.

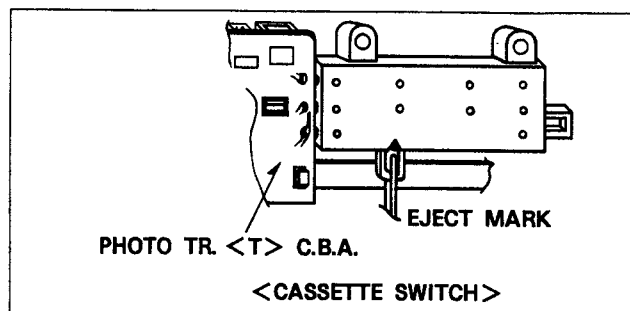


Figure M50-A

2. Remove 3 screws (A) as shown in Figure M50-B.
3. Take the top plate out.
4. Take the cassette Holder unit out as shown in Figure M50-C.

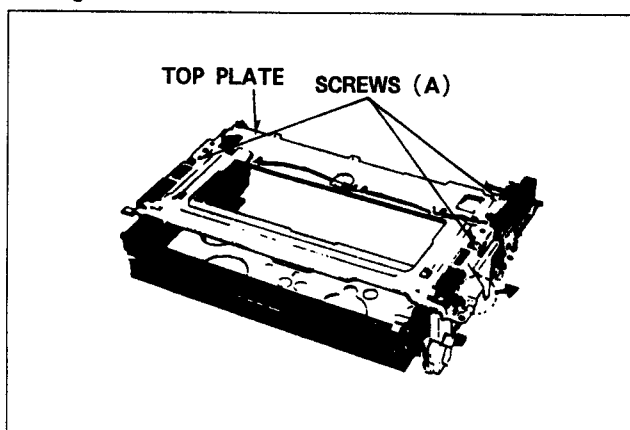


Figure M50-B

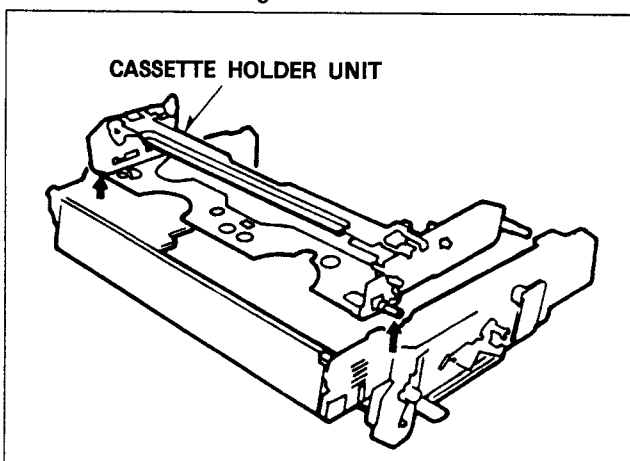


Figure M50-C Removal of Cassette Holder Unit

5. Press the sub wiper arm (R) to direction indicated by arrow so that the sub wiper arm (R) comes to cassette down position (STOP) completely as shown in Figure M50-D and keep it. In this position, the arrow on the Sub Wiper Arm (R) should align with the arrow on the Rack (A)(1) Unit as shown in Figure M50-E.

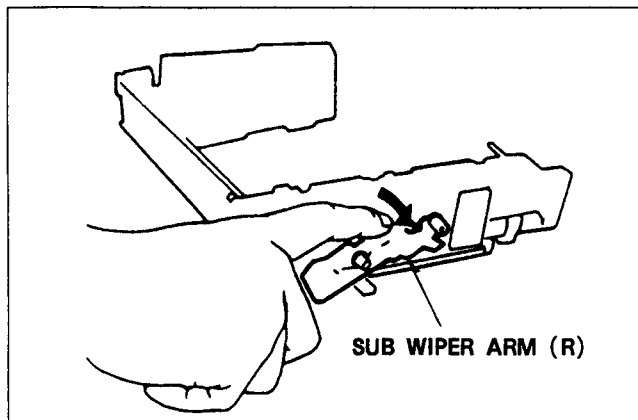


Figure M50-D

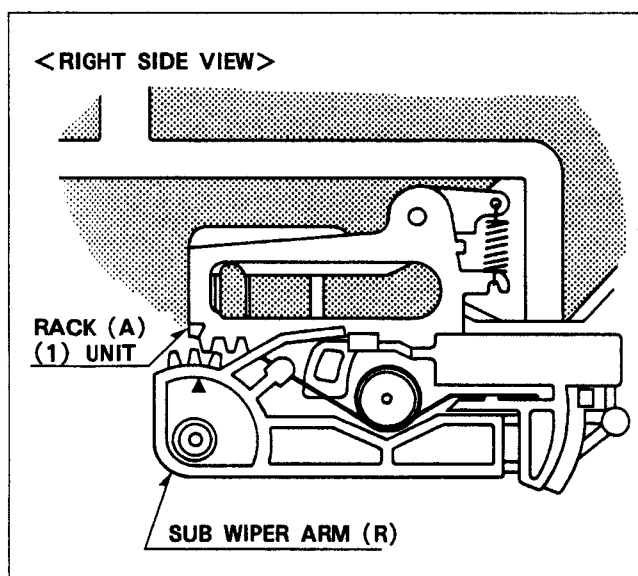


Figure M50-E

6. If the Cassette Compartment is not aligned, realignment may be accomplished by pushing the Main Shaft Unit to the right (gently) and pushing the front of the Rack Unit to the left. This procedure will disengage the teeth of the Rack Gear from the teeth on Sub Wiper Arm assembly. This will allow you to change the positional relationship between the Sub Wiper Arm Assembly and Rack Unit. This procedure is best attempted in the EJECT position. Once this is done, check for smooth operation of the compartment by inserting a cassette, and pushing in, and down.

C. Installation Procedure

1. Bring loading mechanism to the STOP (Sub-load) position.
2. Confirm that the chassis is aligned properly for Alignment Condition as shown in Figure M39-B and M39-C.
3. Put the Sub Wiper Arm (R) in its full down position (Sub Wiper Arm should rest on plastic protrusion on the bottom of the right side plate).
4. Install the cassette compartment (without cassette holder) to chassis so that the rectangular marking (or slot) on the connection gear should be line up with first tooth of the Rack Gear as shown in Figure M50-F and M50-G.

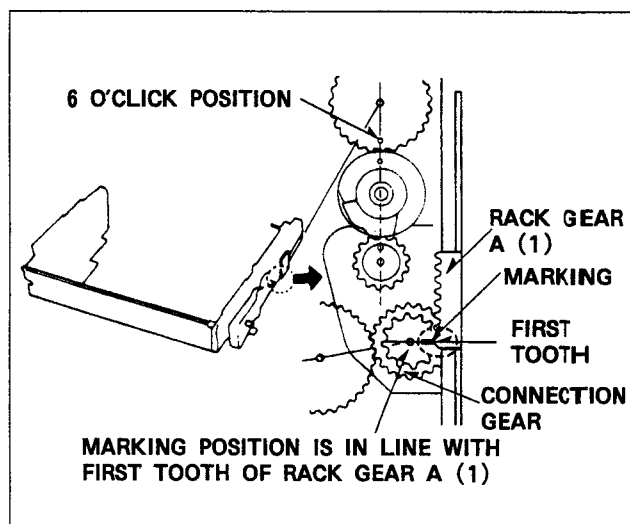


Figure M50-F

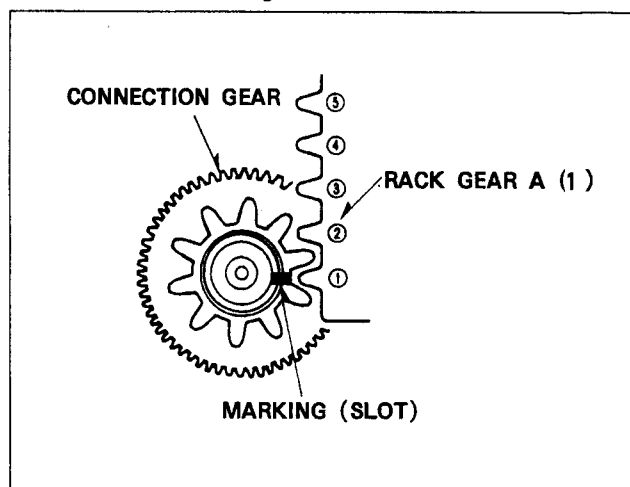


Figure M50-G

5. Tighten the 4 screws (D) as shown in Figure M50-H.

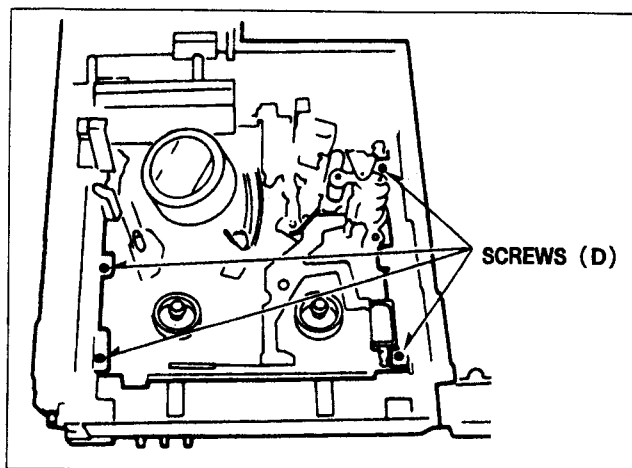


Figure M50-H

6. Manually move the loading mechanism toward the EJECT position.
7. Stop the manual eject procedure just before completion, so that the Sub Wiper Arms straight up. This position is also characterized by the channel guides (in the Wiper Arms) being directly under the cut outs on the top of the Cassette Compartment base (Figure M50-I).
8. Install the Cassette Holder Unit in the Cassette Compartment Base. The Cassette holder should drop into place if the Sub Wiper Arms are positioned as called for in step 7.

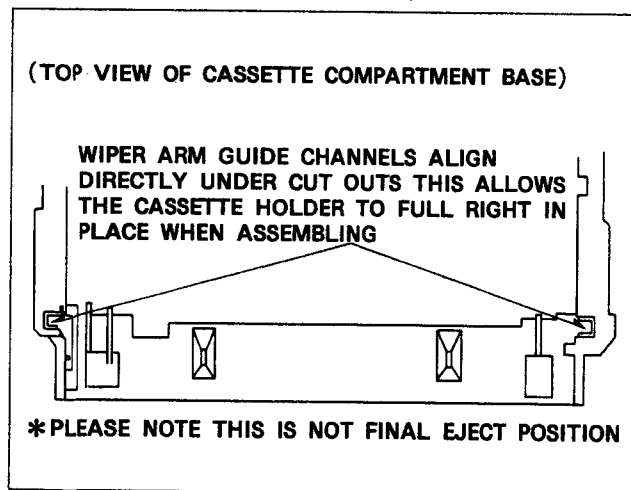


Figure M50-I

Note: For proper front loading, the guide pin on the opener lever should follow the upper track of the right side panel as shown in Figure M50-J.

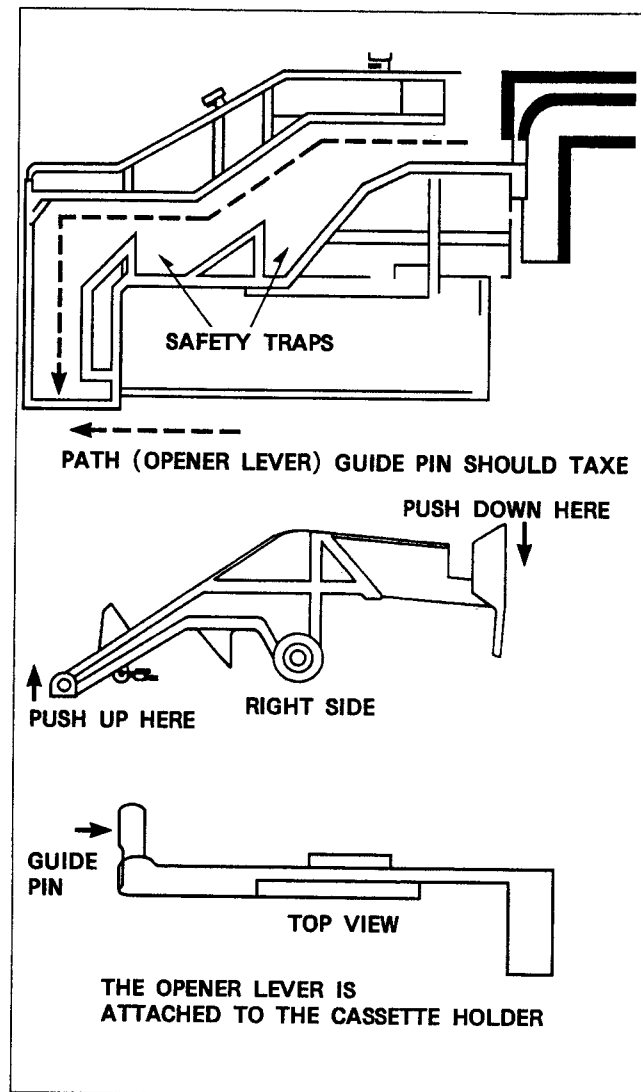


Figure M50-J Right Side Plate

9. Install the top plate on the Cassette Compartment Base and tighten the 3 screws (A) as shown in Figure M50-B.
10. Manually confirm that front loading and main loading run smoothly. Also confirm EJECT before power is applied.

SECTION 4

ELECTRICAL ADJUSTMENTS

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4-1. TEST & SERVICE EQUIPMENT

To perform the electrical adjustment completely the following equipments are required.

1. VTVM (Vacuum Tube Volt Meter)
Capacity : 0.001 to 50V
2. DVM (Digital Volt Meter)
Capacity : 0.001 to 50V
3. Dual-Trace Oscilloscope (with probes)
Capacity : 0.005 to 50V/div, DC to 30MHz
4. Frequency Counter
Capacity : 0 to 10MHz
5. Sine Wave Signal Generator (RC Oscillator)
Capacity : 0 to 10MHz
6. Video Signal Generator (Composite)
7. Spectrum analyzer
8. Color Monitor TV
9. Waveform Monitor
10. Alignment Tape (VFM8080HQFP)

4-2. HOW TO READ THE ADJUSTMENT PROCEDURE TABLE

BOARD	MAIN C.B.A.
TP	TP3502 [F-2]
ADJ	VR2002 [A-3]
TAPE	ALIGNMENT TAPE
INPUT	COLOUR BAR
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	$T = 8.5 \pm 0.5H$

BOARD: Adjustment position of Print Circuit Board.
TP: Connection point (Test Point) of measuring equipment
 * () shown TP location on the board.
ADJ.: Adjustment component
 * () shown VR location on the board.
TAPE: Tape for adjustment.
INPUT: Supply a signal for adjustment.
MODE: Mode of VTR.
 Example: REC → PLAY is recording signal and playback the portion just recorded.
M.EQ: Measuring equipment.
SPEC: Specification for adjustment.

4-3. ELECTRICAL ADJUSTMENT PROCEDURES

4-3-1. PG SHIFTER ADJ.

BOARD	SERVO & SYSTEM CONTROL C.B.A.
TP	TP8002(HEAD SW)(A-1), VIDEO OUT
ADJ	VR2002(A-4)
TAPE	VFM8180HADH PORTION: 2
INPUT	
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	$T = 8.5 \pm 0.5H$

Note: This adjustment should be performed only after completion of the Tape Interchangeability adjustment.

1. Playback the alignment tape at the portion 2.
2. Connect the oscilloscope to TP8002 for CH1 and Video Out for CH2.
3. Adjust VR2002 so that the falling edge of switching pulse becomes $8.5 \pm 0.5H$ before the V-sync portion as shown in Figure E1.

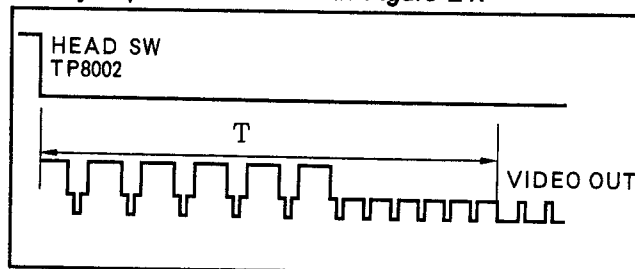


Figure E1

4-3-2. SLOW FREE RUN ADJ.

BOARD	SERVO & SYSTEM CONTROL C.B.A.
TP	TP8009(A-1)
ADJ	VR2001(A-4)
TAPE	VFM8180HADH, PORTION: 2
INPUT	
MODE	PLAY PAUSE
M.EQ	FREQUENCY COUNTER
SPEC	$455Hz \pm 5Hz$

1. Playback the alignment tape at the portion 2.
2. Connect a jumper wire between TP8006 and GND on the Video 3 C.B.A.
3. Connect the frequency counter to TP8009 on the Video 3 C.B.A.
4. Adjust VR2001 so that the reading of frequency counter is $f = 455Hz \pm 5Hz$.
5. After this adjustment remove the jumper wire from TP8006 and GND.

4-3-3. SLOW TRACKING ADJ.

BOARD	SERVO & SYSTEM CONTROL C.B.A.
TP	VIDEO OUT
ADJ	FWD: VR2005(A-3), REV: VR2006(A-3)
TAPE	COLOUR BAR SIGNAL RECORDED TAPE
INPUT	
MODE	SLOW PLAY BACK
M.EQ	MONITOR TV
SPEC	NO NOISE BAR

Note: This adjustment should be performed only after completion of 4-3-2. SLOW FREE RUN adj.

1. Record the colour bar signal for a few minutes.
2. Playback the recorded portion in still mode.
3. Push the tracking button "+" and "-" at same time.
4. Adjust VR2005 and VR2006 so that the noise bar dose not appear and lower on the monitor TV.

4-3-4. V-LOCK ADJ.

BOARD	SERVO & SYSTEM CONTROL C.B.A.
TP	VIDEO OUT
ADJ	VR2004(A-3)
TAPE	BLANK TAPE
INPUT	COLOUR BAR
MODE	STILL
M.EQ	MONITOR TV
SPEC	NO V-DANCING

Note: This adjustment should be performed only after completion of 4-3-3. SLOW TRACKING Adj.

1. Record the colour bar signal for a few minutes.
2. Playback the recorded portion in still mode.
3. Adjust VR2004 so that the V-dancing dose not appear and lower on the monitor TV.

4-3-5. AUTO TRACKING GAIN ADJ.

BOARD	VIDEO 1 C.B.A.
TP	TP3005(D-3)
ADJ	VR3005(C-2)
TAPE	
INPUT	SINE WAVE (4MHz, 200mVp-p)
MODE	E-E
M.EQ	OSCILLOSCOPE
SPEC	2.5V \pm 0.1V

[SET UP]

S-VHS : OFF
INPUT : LINE

1. Set the sinewave generator output to 4MHz, 200mVp-p.
2. Supply the sinewave signal to TP3006.
3. Connect the oscilloscope to TP3005.
4. Adjust VR3005 so that the level is 2.5V \pm 0.1V.

4-3-6. DOC BALANCE ADJ.

BOARD	VIDEO 1
TP	TP3001(B-1)
ADJ	VR3001(E-1)
TAPE	
INPUT	COLOUR BAR SIGNAL
MODE	E-E
M.EQ	OSCILLOSCOPE
SPEC	LESS THAN 50mVp-p

1. Supply the colour bar signal to video input.
2. Connect the oscilloscope to TP3001.
3. Adjust VR3001 so that the video level becomes minimum as much as possible (Figure E2).

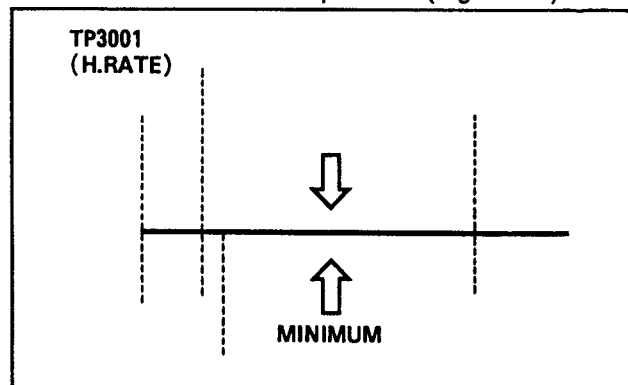


Figure E2

4-3-7. CNR ADJ.

BOARD	VIDEO 1 C.B.A.
TP	T3804(A-1)
ADJ	VR3803(A-1), VR3806(A-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	COLOUR BAR SIGNAL
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	C LEVEL = MINIMUM

Note: This adjustment should be always completed after 4-3-6. DOC BALANCE adj.

[SET UP]

S-VHS SW = ON

1. Record the colour bar signal a few minutes by the S-VHS mode.
2. Connect the oscilloscope to TP3804.
3. Playback the just recorded portion.
4. Adjust VR3803 and VR3806 mutually so that chroma signal becomes minimum as possible.

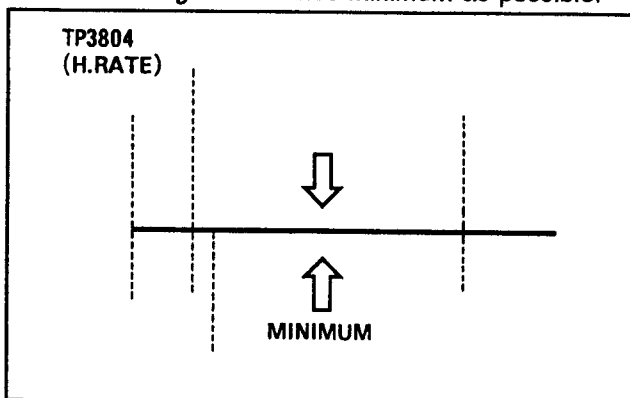


Figure E3

4-3-8. CHARACTER POSITION ADJ.

BOARD	VIDEO 2 C.B.A.
TP	VIDEO OUT
ADJ	C3111 (B-1)
TAPE	
INPUT	COLOUR BAR SIGNAL
MODE	E-E
M.EQ	MONITOR
SPEC	SEE FIGURE

1. Supply a colour bar signal to the video input.
2. Set the MENU Switch to SET.
The menu screen appears on the monitor TV. (If the Hour Meter is appeared, advance to the next page by using the PLAY (-) or REC (+) button.)
3. Adjust C3111 so that the end of the cursor is located as shown in Figure E4.

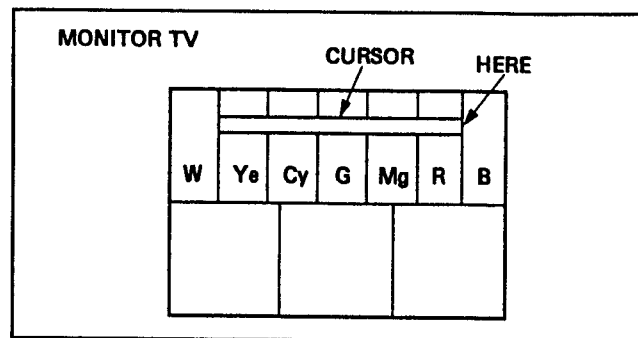


Figure E4

4-3-9. A/D INPUT LEVEL ADJ.

BOARD	VIDEO 3
TP	TP8001(D-1)
ADJ	VR8001(D-1)
TAPE	
INPUT	COLOUR BAR SIGNAL
MODE	E-E
M.EQ	OSCILLOSCOPE
SPEC	2.4Vp-p \pm 0.05Vp-p

[SET UP]

INPUT : LINE

1. Supply a colour bar signal to video input.
2. Connect the Oscilloscope to TP8001.
3. Adjust VR8001 so that video level is 2.4Vp-p \pm 0.05Vp-p as shown in Figure E5.

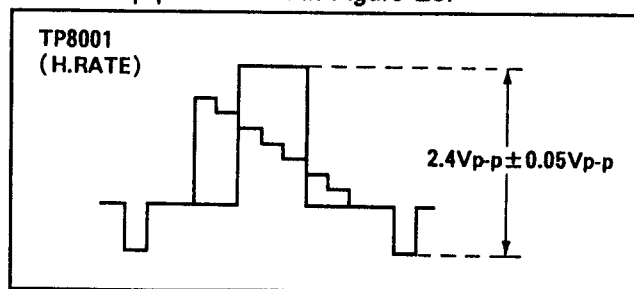


Figure E5

4-3-10. E-E OUTPUT LEVEL ADJ.

BOARD	VIDEO 2 C.B.A.
TP	VIDEO OUT
ADJ	VR3305
TAPE	
INPUT	COLOUR BAR SIGNAL
MODE	E-E
M.EQ	WAVE FORM MONITOR
SPEC	Y : LEVEL = $1.0 \pm 0.02\text{Vp-p}$ C : LEVEL = $0.65 \pm 0.15\text{VP-P}$

[SET UP]

INPUT SW : LINE

1. Supply the colour bar signal to video input.
2. Connect the waveform monitor to video output with a 75Ω termination.
3. Adjust VR3305 so that the Y level becomes $1.0 \pm 0.02\text{Vp-p}$ as shown in Figure E6.
4. Confirm the cyan level are $0.65 \pm 0.15\text{Vp-p}$.

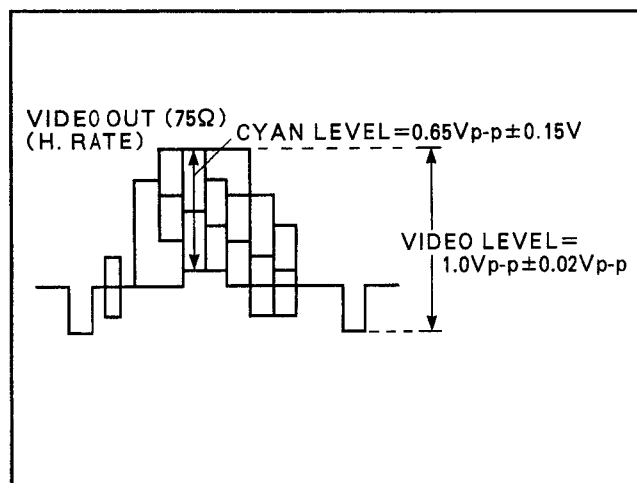


Figure E6

4-3-11. S-VHS RECORDING CURRENT ADJ.

BOARD	VIDEO 1 C.B.A. / HEAD AMP C.B.A.
TP	TP5003(H)(B-4), TP5002(L)(B-4)
ADJ	VR5001(REC-Y)(B-4), VR5002(REC-C)(B-4)
TAPE	S-VHS BLANK TAPE
INPUT	COLOUR BAR SIGNAL
MODE	REC
M.EQ	OSCILLOSCOPE
SPEC	$35\text{mVp-p} \pm 2\text{mVp-p(C)}$, $150\text{mVp-p} \pm 10\text{mVp-p(Y)}$

[SET UP]

S-VHS SW : ON
INPUT : LINE

1. Supply the colour bar signal to video input.
2. Connect the oscilloscope to TP5003 (HOT) and TP5002 (GND).
3. Place the unit in recording mode with colour bar signal.
4. Before chrominance recording current adjustment, luminance recording current (VR5001) should be closed to observe the chrominance signal.
5. Adjust VR5002 for $35\text{mVp-p} \pm 2\text{mVp-p}$ as a cyan level of the chrominance signal as shown in Figure E7.
6. Next, adjust VR5001 for $150\text{mVp-p} \pm 10\text{mVp-p}$ as luminance signal us shown in Figure E8.

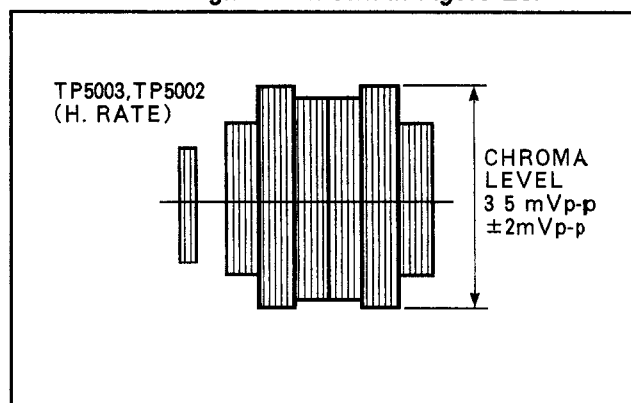


Figure E7

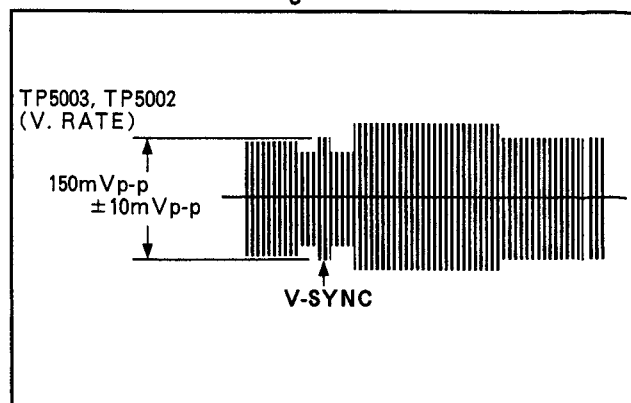


Figure E8

4-3-12. VHS RECORDING CURRENT ADJ.

BOARD	VIDEO 1 C.B.A. / HEAD AMP C.B.A.
TP	TP5003(H)(B-4), TP5002(L)(B-4)
ADJ	VR3008(C-1)
TAPE	BLANK TAPE
INPUT	COLOUR BAR SIGNAL
MODE	REC/PLAY
M.EQ	OSCILLOSCOPE
SPEC	150mVp-p ± 10mVp-p

Note: This adjustment should be always completed after S-VHS Recording Current Adjustment.

[SET UP]

S-VHS SW : OFF
INPUT : LINE

- 1. Supply the colour bar signal to video input.
- 2. Connect the oscilloscope to TP5003 (HOT) and TP5002 (GND).
- 3. Place the unit in recording mode with colour bar signal.
- 4. Adjust VR3008 for 150mVp-p ± 10mVp-p as a luminance signal as shown in Figure E9.

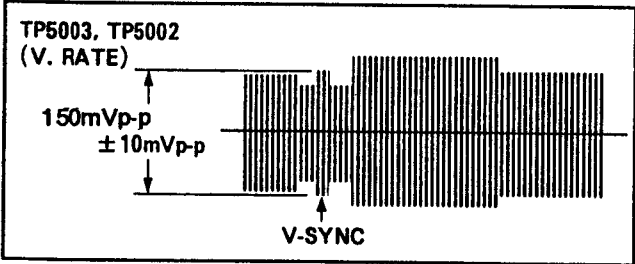


Figure E9

4-3-13. VHS PLAYBACK A/D LEVEL ADJ.

BOARD	VIDEO 1/VIDEO 3
TP	TP8001(D-1)
ADJ	VR3003(C-1)
TAPE	VHS SELF RECORDED TAPE
INPUT	COLOUR BAR SIGNAL
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	2.4Vp-p ± 0.1Vp-p

Note: This adjustment should be always completed after completion of all adjustments on the recording loop.

[SET UP]

S-VHS SW : OFF
INPUT : LINE
EDIT SW : OFF

- 1. Supply the colour bar signal to video input.
- 2. Record the colour bar signal.
- 3. Connect the oscilloscope to TP8001.
- 4. Playback the just recorded portion.
- 5. Adjust VR3003 so that the level is 2.4Vp-p ± 0.1Vp-p as shown in Figure E10.

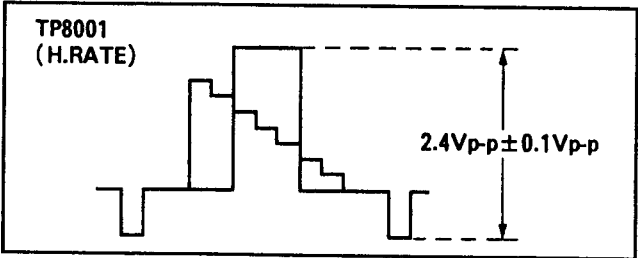


Figure E10

4-3-14. VHS Y PLAYBACK LEVEL ADJ.

BOARD	VIDEO 3 C.B.A.
TP	VIDEO OUT
ADJ	VR8002(D-1)
TAPE	VHS SELF RECORDED TAPE
INPUT	COLOUR BAR
MODE	PLAY
M.EQ	WAVEFORM MONITOR
SPEC	1.0Vp-p \pm 0.02Vp-p

Note: This adjustment should be always completed after completion of all adjustments on the recording loop.

[SET UP]

S-VHS SW : OFF
INPUT SW : LINE
EDIT SW : OFF

1. Supply the colour bar signal to video input and recording it for a few minute.
2. Connect the waveform monitor to the video out with a 75 Ω termination.
3. Playback the just recorded portion.
4. Adjust VR8002 for 1.0Vp-p \pm 0.02Vp-p as a luminance level as shown in Figure E11.

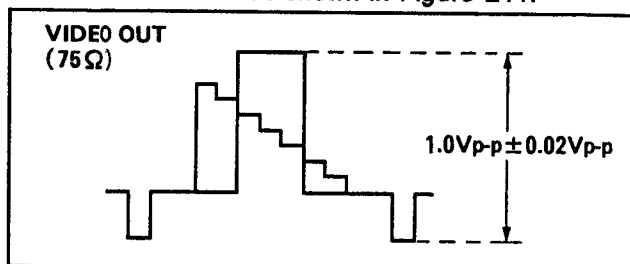


Figure E11

4-3-15. S-VHS SUB EMPHASIS LEVEL ADJ.

BOARD	VIDEO 1 C.B.A.
TP	TP3002(D-1)
ADJ	VR3004(C-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	COLOUR BAR
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	400mVp-p \pm 10mVp-p

Note: This adjustment should be always completed after completion of all adjustments on the recording loop.

[SET UP]

S-VHS SW : ON
EDIT SW : OFF

1. Supply the colour bar signal to video input and record it for a few minute.
2. Playback the just recorded portion.
3. Connect the oscilloscope to TP3002.
4. Adjust VR3004 for 400mVp-p \pm 10mVp-p as shown in Figure E12.

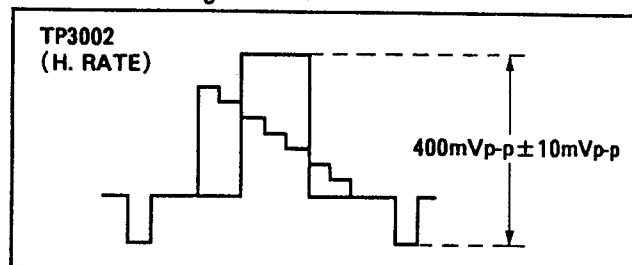


Figure E12

4-3-16. S-VHS PLAYBACK Y LEVEL ADJ.

BOARD	VIDEO 1
TP	VIDEO OUT
ADJ	VR3002(D-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	COLOUR BAR SIGNAL
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	1.0Vp-p \pm 0.02Vp-p

Note: This adjustment should be always completed after completion of all adjustments on the recording loop and VHS playback adjustment.

[SET UP]

S-VHS SW : ON
INPUT SW : LINE
EDIT SW : OFF

1. Supply the colour bar signal to video input and recording it for a few minutes.
2. Connect the oscilloscope to the video out with a 75 Ω termination.
3. Playback the just recorded portion.
4. Adjust VR3002 for 1.0Vp-p \pm 0.02Vp-p as shown in Figure E13.

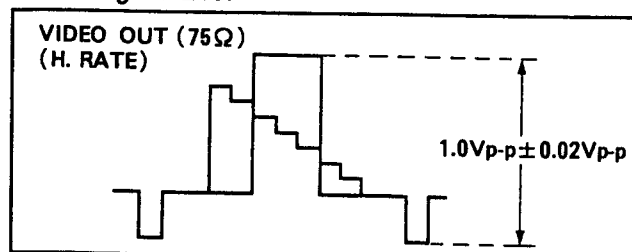


Figure E13

4-3-17. VHS PLAYBACK FREQUENCY RESPONSE ADJ.

BOARD	VIDEO 1 C.B.A.
TP	VIDEO OUT
ADJ	VR3009(C-1)
TAPE	SELF RECORDED TAPE
INPUT	SWEEP (WITH OUT BURST)
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	100KHz : 2MHz = 5 : 5.0 ± 1.0

1. Set the sweep generator output as shown in Figure E14.
2. Record the sweep signal.
3. Playback the just recorded portion.
4. Connect the oscilloscope to video out.
5. Adjust VR3009 so that the playback frequency response becomes 5 : 5.0 ± 1.0 at the marker points of 100KHz and 2MHz as shown in Figure E15.
(Vary the vertical scope setting until the 100KHz level reaches 5 division)

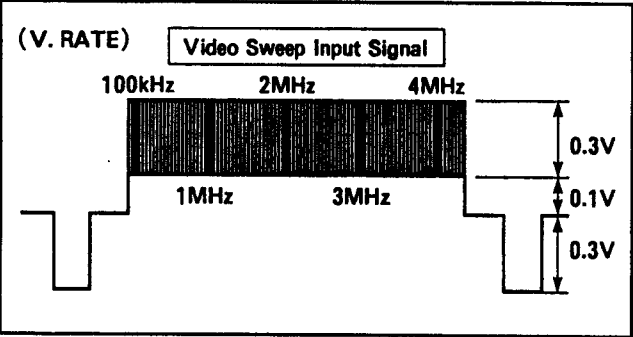


Figure E14

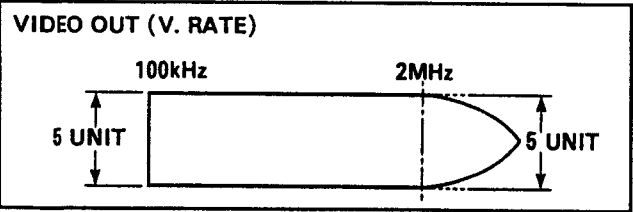


Figure E15

4-3-18. S-VHS PLAYBACK FREQUENCY RESPONSE

BOARD	VIDEO 1
TP	VIDEO OUT
ADJ	VR3006(C-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	SWEEP (WITHOUT BURST)
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	100KHz : 4MHz = 5 : 4.0 ± 0.5

1. Set the sweep generator output as shown in Figure E16.
2. Record the sweep signal.
3. Playback the just recorded portion.
4. Connect the oscilloscope to video out.
5. Adjust VR3006 so that the playback frequency response becomes 5 : 4.0 ± 0.5 at the marker point of 100KHz and 4MHz as shown in Figure E17.
(Vary the vertical scope setting until the 100KHz level reaches division)

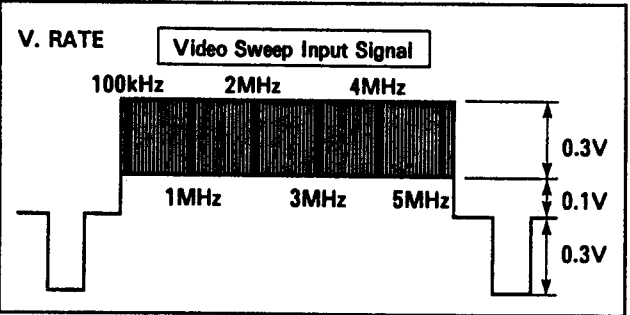


Figure E16

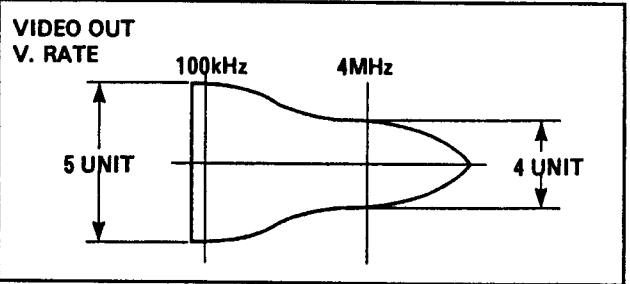


Figure E17

4-3-19. S-VHS SUPER LIMITER ADJ.

BOARD	VIDEO 1 C.B.A.
TP	TP3003(C-2)
ADJ	VR3007(C-2)
TAPE	
INPUT	SINEWAVE (7MHz 200mVp-p)
MODE	E-E
M.EQ	OSCILLOSCOPE
SPEC	400mVp-p \pm 20mVp-p

Note: Prepare the oscilloscope which is type's more than 100MHz.

[SET UP]
S-VHS ON

1. Set the signal generator (sine-wave) to 7MHz, 200mVp-p and supply it to TP3004.
2. Connect the 100MHz type's oscilloscope to TP3003.
3. Adjust VR3007 so that the level becomes 400mVp-p \pm 20mVp-p as show in Figure E18.

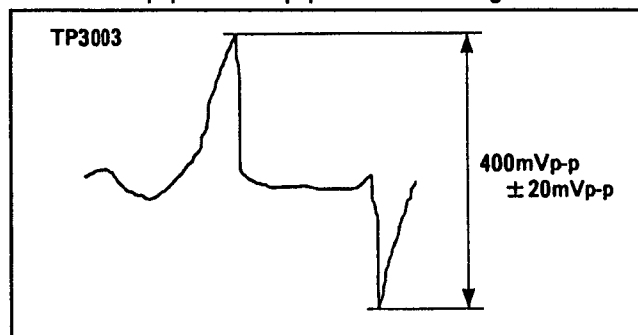


Figure E18

4-3-20. WHITE BALANCE ADJ.

BOARD	VIDEO 2 C.B.A.
TP	VIDEO OUT
ADJ	VR3302(D-1), VR3303(D-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	COLOUR BAR SIGNAL
MODE	PLAY
M.EQ	VECTORSCOPE
SPEC	REFER TO FIG E19

[SET UP]

S-VHS SW : ON
INPUT SW : LINE

1. Supply the colour bar signal to video input.
2. Record the colour bar signal by S-VHS mode for a few minutes.
3. Connect the vectorscope to video output.
4. Playback the just recorded portion.
5. Adjust VR3302 and VR3303 so that the point "C" becomes center as shown in Figure E19.

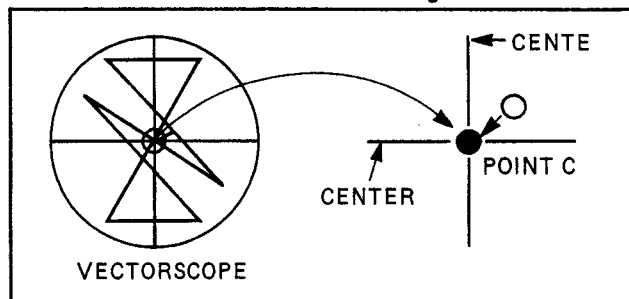


Figure E19

4-3-21. PLAYBACK CHROMA LEVEL ADJ.

BOARD	VIDEO 2 C.B.A.
TP	VIDEO OUT
ADJ	VR3304(D-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	COLOUR BAR
MODE	PLAY
M.EQ	WAVE FORM MONITOR
SPEC	0.65Vp-p \pm 0.03Vp-p

[SET UP] S-VHS SW : ON

1. Supply the colour bar signal to video input and record it for a few minute.
2. Connect the waveform monitor to video output with a 75 Ω termination.
3. Playback the just recorded portion.
4. Adjust VR3304 so that the cyan level becomes 0.65Vp-p \pm 0.03Vp-p as shown in Figure E20.

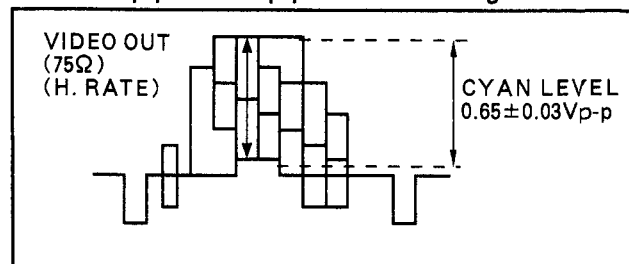


Figure E20

4-3-22. Y/C TIMING ADJ.

BOARD	VIDEO 2
TP	VIDEO OUT
ADJ	VR3301 (D-1)
TAPE	S-VHS SELF RECORDED TAPE
INPUT	SIN ₂ PULSE & BAR
MODE	PLAY
M.EQ	WAVE FORM MONITOR
SPEC	REFER TO E22

[SET UP]

S-VHS SW : ON
INPUT SW : LINE
EDIT SW : OFF

1. Supply the SIN₂ Pulse for signal to video input.
2. Record the colour bar signal by S-VHS mode for a few minuter.
3. Connect the waveform monitor to video output and expand the "A" portion as shown in Figure E21.
4. Adjust VR3301 so that the waveform becomes as shown in Figure E22.

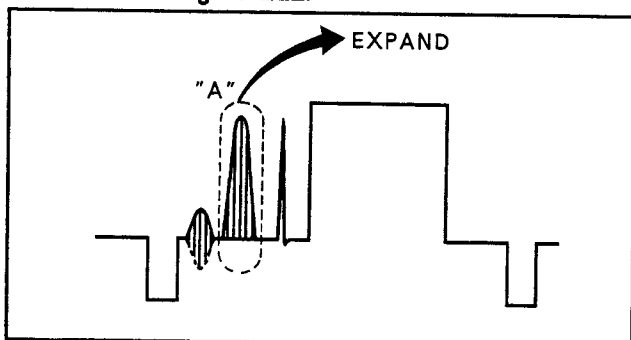


Figure E21

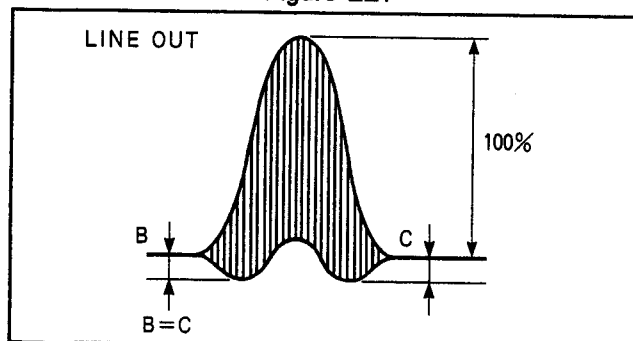


Figure E22

4-3-23. PRE-AMPLIFIER ADJ.

BOARD	AUDIO C.B.A.
TP	AUDIO OUTPUT CH1, CH2
ADJ	Hi-Fi CH1: VR4501(C-1), CH2: VR4502(C-1)
TAPE	
INPUT	1KHz, -8dBv SINEWAVE SIGNAL
MODE	STOP
M.EQ	V.T.V.M.
SPEC	Hi-Fi OUTPUT : -8dBv \pm 0.2dBv NORM OUTPUT : -8dBv \pm 1dBv

1. Set the Hi-Fi audio level control VR (CH1, CH2) on the Front Panel to the centre click position.
2. Set the audio output select switch to Hi-Fi mode.
3. Supply 1KHz, -8dBv sinewave signal to audio input.
4. Connect the V.T.V.M. to audio output.
5. Adjust VR4501 (CH1), VR4502 (CH2) so that the levels become -8.0dBv \pm 0.2dBv.
6. Set the audio output select switch to NORM mode.
7. Confirm the CH1 and CH2 levels are -8.0dBv \pm 1.0dBv.

4-3-24. AUDIO LEVEL METER ADJ.

BOARD	AUDIO C.B.A.
TP	AUDIO LEVEL METER
ADJ	CH1 : VR4505(B-3), CH2 : VR4506(B-3)
TAPE	
INPUT	1KHz, -8dBv SINEWAVE SIGNAL
MODE	STOP
M.EQ	
SPEC	Hi-Fi : 0dB, NORM : 0dB

Note: This adjustment should be performed only after completion of 4-3-23. PRE-AMPLIFIER ADJ.

1. Set the audio output select switch to Hi-Fi mode.
2. Set the Hi-Fi audio level control VR (CH1, CH2) on the Front Panel to the centre click position.
3. Supply 1KHz, -8dBv sinewave signal to audio inputs (CH1, CH2).
4. Adjust VR4505 (CH1) and VR4506 (CH2) so that the Audio Level Meter shows 0dB as shown in Figure E23.

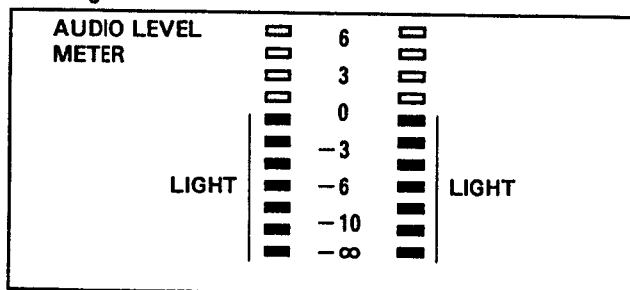


Figure E23

4-3-25. NORMAL AUDIO FREQUENCY RESPONSE ADJ.

BOARD	AUDIO C.B.A.
TP	AUDIO OUTPUT (CH1, CH2)
ADJ	CH1: VR4001(B-1), CH2: VR4003(B-1)
TAPE	VFM8180HADH, PORTION : 3
INPUT	
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	400Hz - 5kHz (± 0.5 dB)

1. Set the VR4002 and VR4004 to centre position.
2. Set the Audio output select switch to NORM.
3. Connect a scope to Audio Outputs (CH1, CH2).
4. Adjust VR4001 (CH1) and VR4003 (CH2) so that the 400Hz and 5KHz levels become the same (0 ± 0.5 dB) as shown in Figure E24.

Note: After this adjustment is finished, adjust 4-3-26. Normal Audio PB Gain Adj.

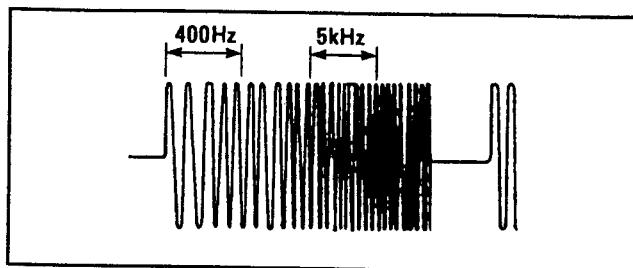


Figure E24

4-3-26. NORMAL AUDIO PLAYBACK GAIN ADJ.

BOARD	AUDIO P.C.B.
TP	CH1, CH2 AUDIO OUTPUT
ADJ	CH1 : VR4002(B-1), CH2 : VR4004(B-1)
TAPE	VFM8180HADH, PORTION: 3
INPUT	
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	300mVp-p ± 15 mV

Note: This adjustment should be performed only after completion of 4-3-25. Normal Audio Frequency Response Adj.

1. Set the audio output select switch to NORM.
2. Connect the a scope to audio outputs (CH1, CH2).
3. Playback the alignment tape (Portion : 3).
4. Adjust VR4002 (CH1) and VR4004 (CH2) so that the levels become 300mVp-p ± 15 mV as shown in Figure 25.

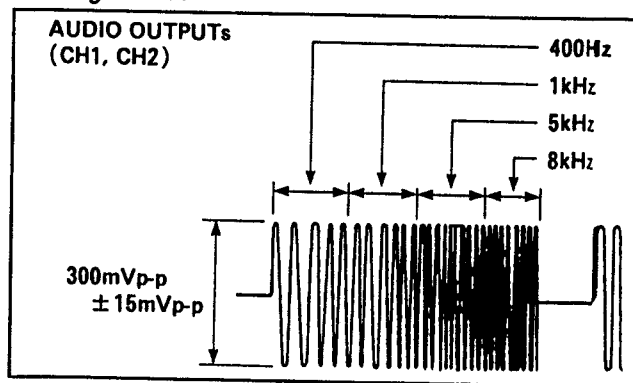


Figure E25

4-3-27. NORMAL AUDIO BIAS CURRENT ADJ.

BOARD	AUDIO C.B.A.
TP	A/C HEAD
ADJ	S-VHS:VR4007(CH1)(A-1), VR4008(CH2)(A-2)
TAPE	S-VHS, VHS BLANK TAPE
INPUT	COLOUR BAR SIGNAL (LINE)
MODE	REC
M.EQ	V.T.V.M.
SPEC	S-VHS CH1: 5.0mVrms \pm 0.1mVrms,
	CH2: 5.0mVrms \pm 0.1mVrms
	VHS CH1: 4.0mVrms \pm 0.3mVrms,
	CH2 4.0mVrms \pm 0.3mVrms

1. Supply the colour bar signal to video input.
2. Insert the S-VHS blank tape and place the deck in REC mode.
3. Connect the V.T.V.M. to the A/C head as shown in Figure E26.
4. Adjust VR4007 (CH1), VR4008 (CH2) so that the levels become 5.0mVrms \pm 0.1mVrms.
5. Insert the VHS blank tape and place the deck in REC mode.
6. Confirm the CH1 and CH2 levels are 4.0mVrms \pm 0.3mVrms.

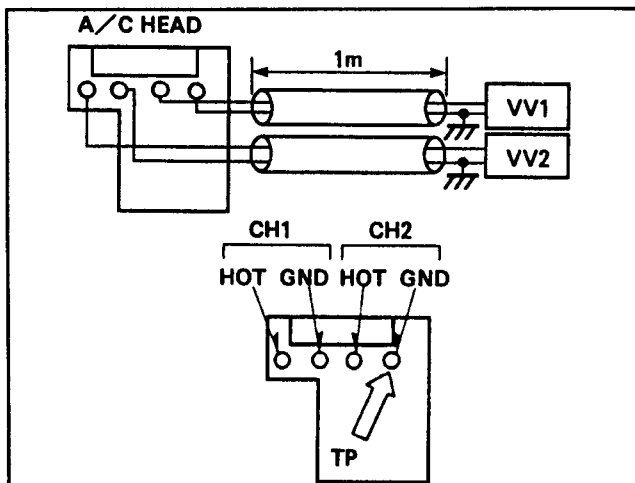


Figure E26

4-3-28. NORMAL AUDIO REC CURRENT ADJ.

BOARD	AUDIO C.B.A.
TP	AUDIO OUTPUT (CH1,CH2) TP4005(CH1)(C-1), TP4006(CH2)(B-1)
ADJ	VR4005(CH1)(C-1), VR4006(CH2)(D-1)
TAPE	S-VHS BLANK TAPE
INPUT	1KHz, -8dBV SINEWAVE
MODE	REC
M.EQ	V.T.V.M. (D.V.M.)
SPEC	S-VHS 0 \pm 0.5dB, VHS 0 \pm 1.0dB

[SET UP]

S-VHS SW : ON

1. Set the audio output select switch to NORM.
2. Connect the V.T.V.Ms to the deck as shown in Figure E27. Note that only one channel will be adjusted at a time.
3. Supply a 1KHz, -8dBV sine wave signal to the AUDIO INPUT (CH1).
4. Place the deck in the REC mode with S-VHS mode.
5. Adjust VR4005 (CH1) so that V.T.V.M. (2) reads approximately 0.5Vrms (1.41Vp-p).
6. Playback the recorded portion, and note the amount of difference between V.T.V.M. (1) and (2).
7. Place the deck in the REC mode again, and readjust VR4005 (CH1) slightly, and repeat step 5, noting the new difference.
8. Repeat this "Record/Set/Note to Playback/Note" record and playback readings is minimized (0dBV \pm 0.5dBV).
9. Repeat the above procedure again for channel 2, using the other set of test points and VRs.

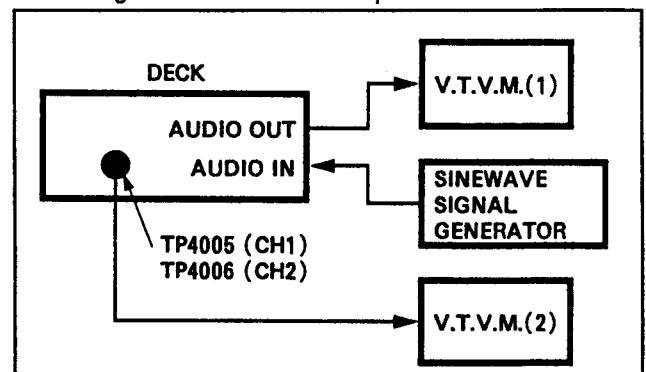


Figure E27

4-3-29. HI-FI AUDIO HEAD SWITCHING SHIFTER ADJ.

BOARD	AUDIO C.B.A.
TP	TP4501(C-1), TP4502(C-1)
ADJ	VR4507(D-1)
TAPE	VFM8180HADH PORTION : 2
INPUT	
MODE	PLAY
M.EQ	OSCILLOSCOPE
SPEC	SEE FIGURE E28

1. Connect the oscilloscope to TP4502 (FM H.SW) for CH1 and TP4501 (FM ENV) for CH2.
2. Playback the alignment tape (VFM8180HADH) portion 1.
3. Adjust VR4507 so that there is no drop-out while push the Tracking buttons ("+" or "-") as shown in Figure E28.

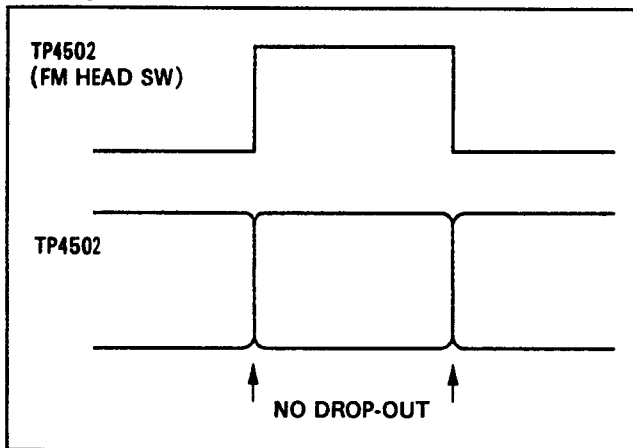


Figure E28

4-3-30. HI-FI AUDIO CARRIER FREQUENCY ADJ.

BOARD	FM AUDIO
TP	Pin25(CH1), Pin24(CH2) of FM AUDIO PACK
ADJ	VR4405 (CH1)(F-2), VR4402 (CH2)(E-4)
TAPE	
INPUT	NO SIGNAL
MODE	STOP
M.EQ	FREQUENCY COUNTER
SPEC	1.4MHz \pm 10KHz(CH1), 1.8MHz \pm 10KHz(CH2)

[SET UP]

HI-FI REC : ON (OSD)

1. Ground the Audio Inputs (CH1, CH2).
2. Connect a counter to pin25 of FM Audio Pack.
3. Adjust VR4405 (CH1) so that the frequency becomes 1.4MHz \pm 10KHz.
4. Connect a counter to pin24 of FM Audio Pack.
5. Adjust VR4402 (CH2) so that the frequency becomes 1.8MHz \pm 10KHz.

4-3-31. HI-FI AUDIO DEVIATION ADJ.

BOARD	FM AUDIO
TP	AUDIO OUTPUT (CH1, CH2)
ADJ	VR4407 (CH1)(E-1), VR4401 (CH2)(E-4)
TAPE	SELF RECORDED TAPE
INPUT	1KHz, -8dBv SINEWAVE
MODE	PLAY
M.EQ	V.T.V.M or OSCILLOSCOPE
SPEC	-8dBv \pm 0.5dBv

[SET UP]

HI-FI REC : ON
AUDIO OUT : HI-Fi

1. Set the Hi-Fi audio level control VR (CH1, CH2) on the Front Panel to the center click position.
2. Supply 1KHz, -8dBv sinewave signal to the audio inputs (CH1, CH2).
3. Record it for a few minutes.
4. Playback the recorded portion.
5. Connect a scope to the Audio outputs (CH1, CH2).
6. Adjust VR4407 (CH1) so that the level becomes -8dBv \pm 0.5dBv.
7. Adjust VR4401 (CH2) so that the level becomes -8dBv \pm 0.5dBv.

4-3-32. HI-FI AUDIO REC CURRENT ADJ.

BOARD	AUDIO
TP	TP5001(B-4)
ADJ	VR4503(C-1), VR4504(C-1)
TAPE	S-VHS SELF RECORD TAPE
INPUT	NO SIGNAL
MODE	
M.EQ	OSCILLOSCOPE
SPEC	CH1: 80mVp-p \pm 5mVp-p, CH2: 350mVp-p \pm 5mVp-p

[SET UP]

HI-FI REC : ON

1. Insert the S-VHS blank tape and place the deck in REC mode.
2. Connect the oscilloscope to TP5001.
3. Turn VR4504 fully counter-clockwise.
4. Adjust VR4503 so that the level becomes 80mVp-p \pm 5mVp-p as shown in Figure E29.
5. Adjust VR4504 so that the level become 350mVp-p \pm 5mVp-p as shown in Figure E30.

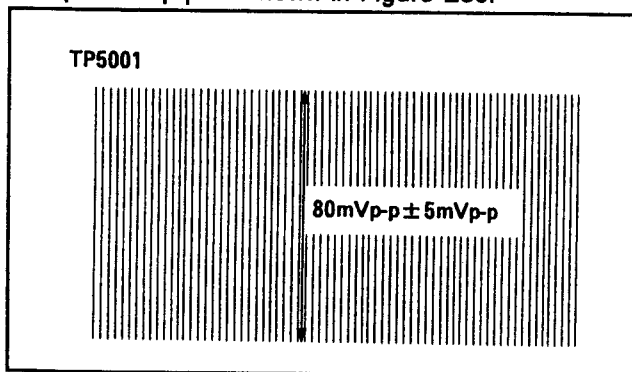


Figure E29

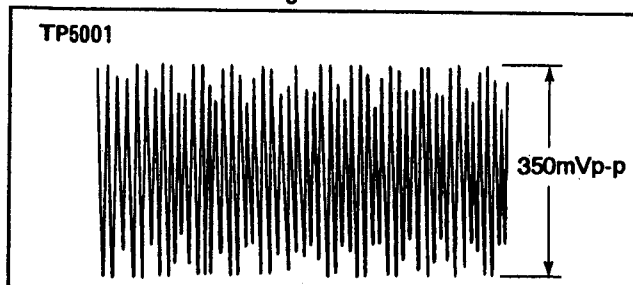


Figure E30

SECTION 5

BLOCK DIAGRAMS

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ABBREVIATION CHART	BLK-2, 3
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SERVO BLOCK DIAGRAM	BLK-6
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VIDEO (2), (3) BLOCK DIAGRAM	BLK-10

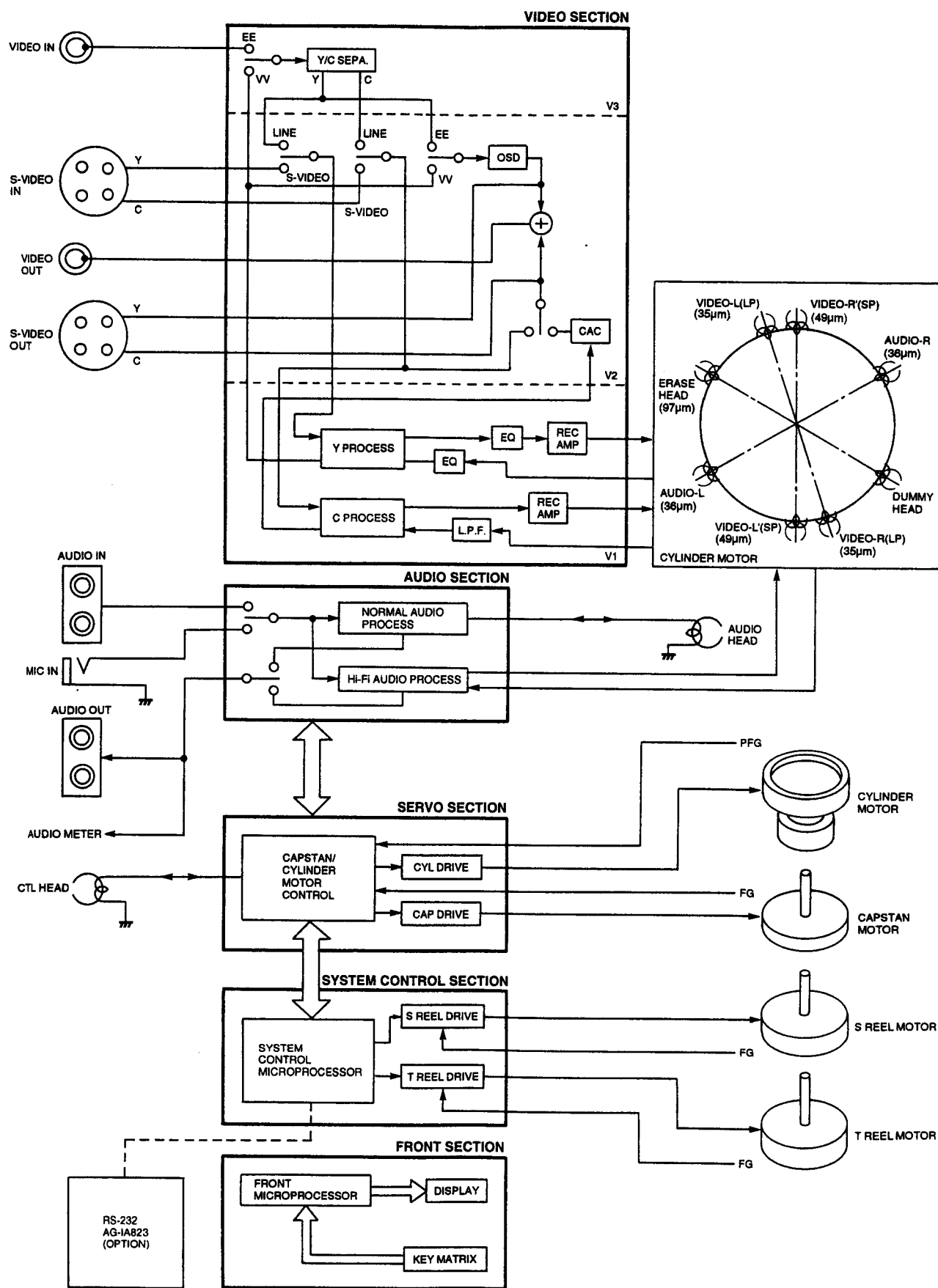
ABBREVIATION CHART

	NAME	SIGNAL		NAME	SIGNAL
A	A 12V	ANALOG 12V DC		CH2 DREC H	CH2 DELAYED RECORDING (H)
	A 5V	ANALOG 4V DC		CH1 AE HEAD	CH1 AUDIO ERASE HEAD
	A GND	ANALOG GROUND		CH2 AE HEAD	CH2 AUDIO ERASE HEAD
	A H SW	ARTIFICIAL VERTICAL SYNC SIGNAL		CH1 LINE OUT	CH1 LINE OUTPUT
	ART V	ARTIFICIAL VERTICAL SYNC SIGNAL		CH2 LINE OUT	CH2 LINE OUTPUT
	A. HEAD L	AUDIO HEAD (L)	D	D GND	DIGITAL GROUND
	A. HEAD C	AUDIO HEAD (C)		D 5V	DIGITAL VOLTAGE 5V
	A. HEAD R	AUDIO HEAD (R)		D REC L	DELATED RECORDING (L)
				DEW	DEW
C	CH2 PHONE	HEAD PHONES OUTPUT (CH2)	E	ENV SEL	RF ENVELOPE SELECT
	CH1 PHONE	HEAD PHONES OUTPUT (CH1)		EDIT H	EDIT (H)
	CAP VM	CAPSTAN MOTOR VOLTAGE		EP L	LP (H)
	CUL	CAPSTAN SPEED CONTROL SIGNAL		EXT SYNC	EXTERNAL SYNC SIGNAL
	CAP RSF	CAPSTAN MOTOR REVERSE /STOP/FORWARD		EE H	RECORDING (H)
	CAP ET	CAPSTAN MOTOR ERROR TORQUE CONTROL		EE 5V	RECORDING 5V
	CAP FG1	CAPSTAN FG1 PULSE		EX REC 5V	EXTERNAL RECORDING 5V
	CAP FG2	CAPSTAN FG2 PULSE		ENVE OUT	RF ENVELOPE SIGNAL OUT
	CYL ET	CYLINDER MOTOR ERROR TORQUE CONTROL	F	FG1	FG1 PULSE
	CYL PFG	CYLINDER PG/FG PULSE		FG2	FG2 PULSE
	CAP ON H	CAPSTAN MOTOR ON (H)		FLY E H	FLYING ERASE (H)
	CAP REV H	CAPSTAN REVERSE (H)		FSC	FS CLOCK SIGNAL
	CTL PULSE	CONTROL PULSE		FLY E HEAD	FLYING ERASE HEAD
	CAP FG	CAPSTAN FG PULSE		FLY E GND	FLYING ERASE GND
	CH2 AE L	CH2 AUDIO ERASE (L)	H	HSS	HORIZONTAL SYNC SIGNAL
	CH1 AE L	CH1 AUDIO ERASE (L)		H SW	HEAD SWITCHING PULSE
	CH2 MUTE H	CH2 AUDIO MUTE (H)		HIFI DREC H	DELATED FM RECORDING (H)
	CH2 DREC L	CH2 DELATED FM RECORDING (L)		HIFI MUTE H	FM AUDIO MUTE (H)
	CH2 EE L	CH2 AUDIO RECORDING (L)		HIFI H	FM AUDIO (H)
	CH1 MUTE H	CH1 AUDIO MUTE (H)		HIFI VR REF	FM AUDIO RECORDING LEVEL REFERENCE
	CH1 D REC L	CH1 DELATED FM RECORDING (L)		HIFI CH2 VR	CH2 FM AUDIO RECORDING VOLUME
	CH1 EE L	CH1 AUDIO RECORDING (L)		HIFI CH1 VR	CH1 FM AUDIO RECORDING VOLUME
	CAS SW	CASSETTE SWITCH		HIFI CH2 OUT	CH2 FM AUDIO OUTPUT
	CH2 METER	CH2 METER SIGNAL		HIFI CH1 OUT	CH1 FM AUDIO OUTPUT
	CH1 METER	CH1 METER SIGNAL		HIFI PB H	FM AUDIO PLAYBACK (H)
	CORR	CORREATION SIGNAL		HIFI D REC (L)	FM DELAYED RECORDING (L)
	COMB Y	COMBINATION LUMINANCE SIGNAL		HEAD SW	HEAD SW PULSE
	COMB C	COMBINATION CHROMINANCE SIGNAL		H.A. SW	HEAD AMP SWITCHING PULSE
	CH2 EE H	CH2 AUDIO RECORDING H	L	LINE OUT	AUDIO LINE OUT SIGNAL
	CH1 LINE IN	CH1 AUDIO LINE IN SIGNAL	M	MIC IN H	MICROPHONE SIGNAL
	CH2 LINE IN	CH2 AUDIO LINE IN SIGNAL		MIC IN	MICROPHONE SIGNAL INPUT
	CH1 PHONE	CH1 PHONE SIGNAL		M GND	MOTOR GROUND
	CH2 PHONE	CH2 PHONE SIGNAL		MONITER NOR L	NORMAL AUDIO MONITER
	CH1 MUT H	CH1 AUDIO MUTE (H)			
	CH2 MUT H	CH2 AUDIO MUTE (H)			

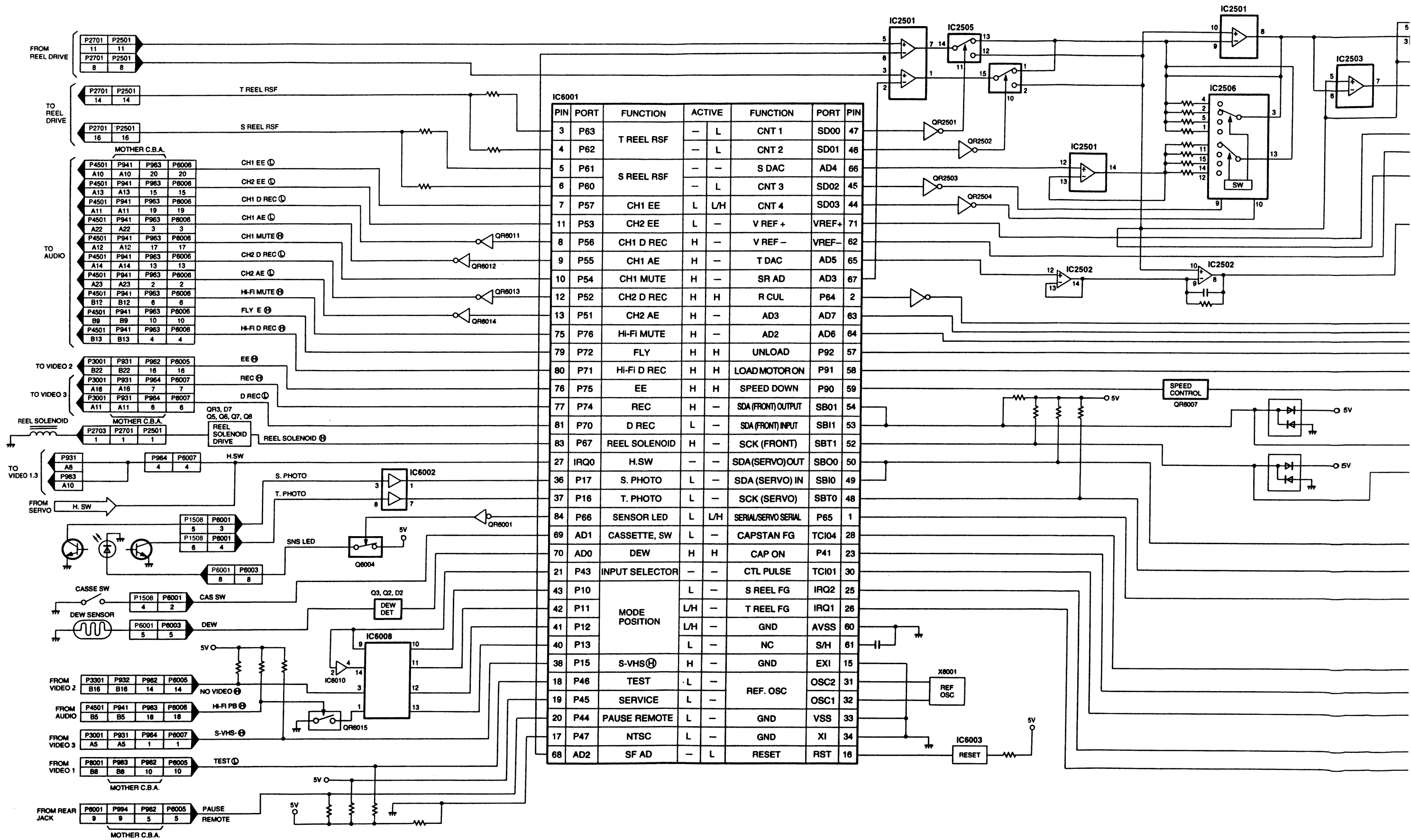
ABBREVIATION CHART

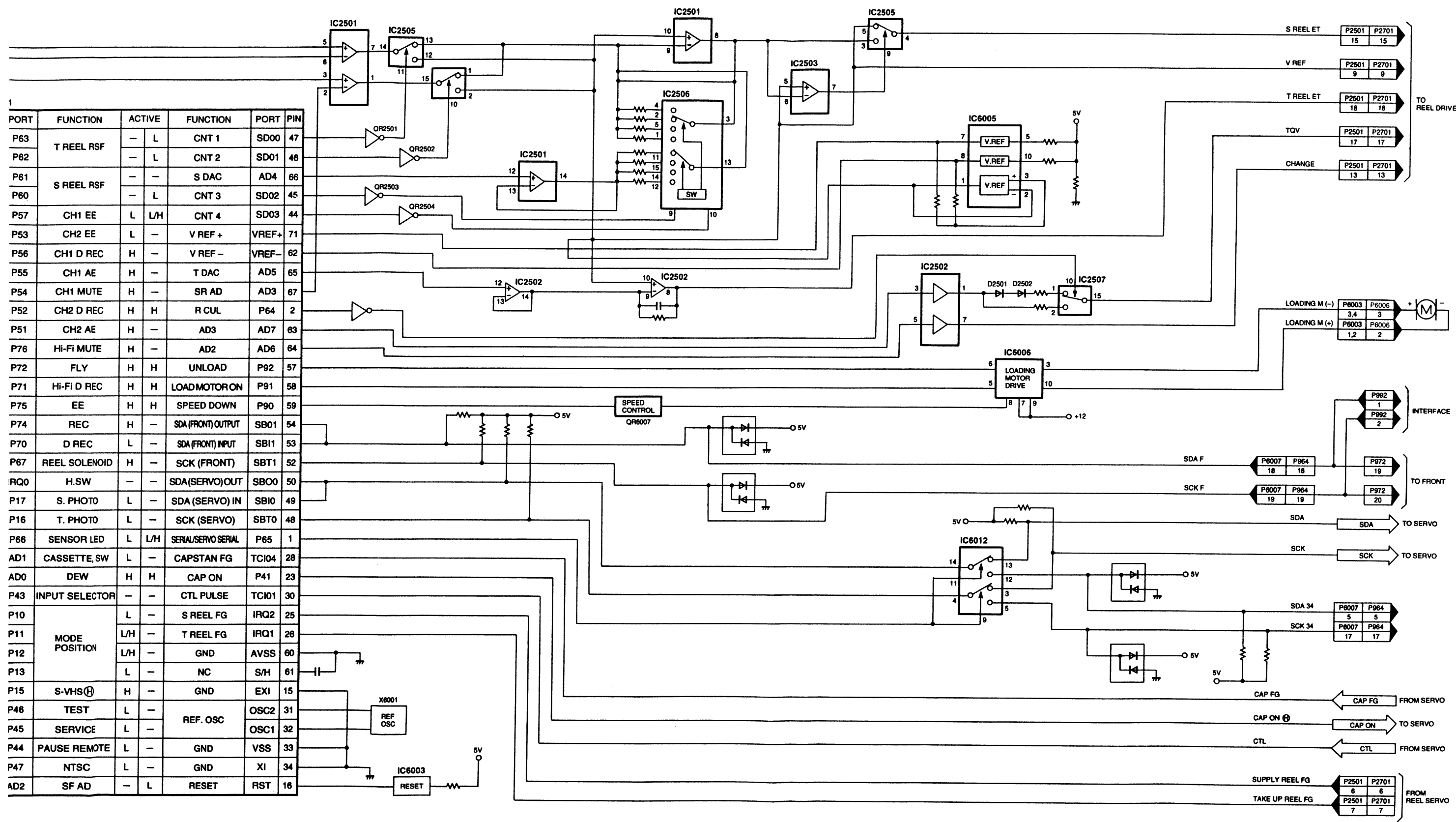
	NAME	SIGNAL		NAME	SIGNAL
M	MONITOR CH1 H MONITOR CH2 H M 14V M 18V MON OUT MON NOR L	FM AUDIO MONITER CH1 (H) FM AUDIO MONITER CH2 (H) MOTOR VOLTAGE 14V MOTOR VOLTAGE 18V NORMAL AUDIO SIGNAL OUTPUT LCH NORMAL AUDIO SIGNAL	S	S REEL VM S REEL FG SR PHOTO S REEL ET S REEL RSF SS SDA S SCK S S CASS L S-VHS H SDA F SCK F SES LED SAFETY TAB (L) SES GND	SYPPLY REEL DRIVE VOLTAGE SYPPLY REEL FG PULSE SYPPLY REEL PHOTO TRANSISTOR SYPPLY REEL ERROR TORQUE CONTROL SYPPLY REEL REVERSE /STOP/FORWARD SYNC SIGNAL SERIAL DATA FOR SERVO SERIAL CLOCK FOR SERVO VHS CASSETTE DETECT (L) SVHS CASSETTE DETECT (H) SERIAL DATA FOR FRONT SERIAL CLOCK FOR FRONT SENSOR LED SAFETY TAB SW ON (L) SENSOR GROUND
	N NOR CH1 OUT NOR CH2 OUT NOR R HEAD NOR L HEAD	NON VIDEO SIGNAL DETECT (H) CH1 NORMAL AUDIO SIGNAL CH2 NORMAL AUDIO SIGNAL NORMAL R-CH HEAD NORMAL L-CH HEAD			
P	PB CTL PAUSE REMOTE POS PLAY POS EJECT POS STOP POS LOAD PICT CTL PB RF C PB EEY PB C PLAY 5V	PLAYBACK CONTROL SIGNAL PAUSE REMOTE CONTROL SIGNAL MECHANISUM POSITION SWITCH PLAY MECHANISUM POSITION SWITCH EJECT MECHANISUM POSITION SWITCH STOP MECHANISUM POSITION SWITCH LOAD PICTURE CONTROL PLAYBACK RF CHROMINANCE SIGNAL PLAYBACK/RECORDING LUMINANCE SIGNAL PLAYBACK CHROMINANCE SIGNAL PLAY 5V	T	T REEL VM T REEL FG T REEL RSF TQU T REEL ET TRACK ENV TEST L TRICK L TRICK (H)	TAKE UP REEL DRIVE VOLTAGE TAKE UP REEL FG PULSE TAKE UP REEL REVERSE /STOP/FORWARD TORQUE CONTROL TAKE UP REEL ERROR TORQUE CONTROL TRACKING ENVELOPE TEST (L) STILL, SEARCH MODE (L) STILL, SEARCH MODE (H)
			V	V REF VR GND	REFERECE VOLTAGE AUDIO VOLUME GROUND
R	REEL SOL (H) REG +12V ROTARY SW REC H REC C REC Y REC RFC RE C RF Y RF OUT REC 12V REC IN REC OUT RF IN REG 5V	REEL SOLENOID ON (H) REGULATOR +12V ROTARY SWITCH RECORDING (H) RECORDING CHROMINANCE SIGNAL RECORDING LUMINANCE SIGNAL RECORDING RF CHROMINANCE SIGNAL RF CHROMINANCE SIGNAL RF LUMINANCE SIGNAL RF SIGNAL OUTPUT REC 12V REC INPUT RECORDING OUTPUT RF SIGNAL INPUT REG 5V		2.5V REF 4P C IN 4P Y IN 4P C OUT 4P Y OUT 5V	2.5V REFERENCE VOLTAGE 4P CHROMINANCE SIGNAL INPUT 4P LUMINANCE SIGNAL INPUT 4P CHROMINANCE SIGNAL OUTPUT 4P LUMINANCE SIGNAL OUTPUT 5V

OVERALL BLOCK DIAGRAM

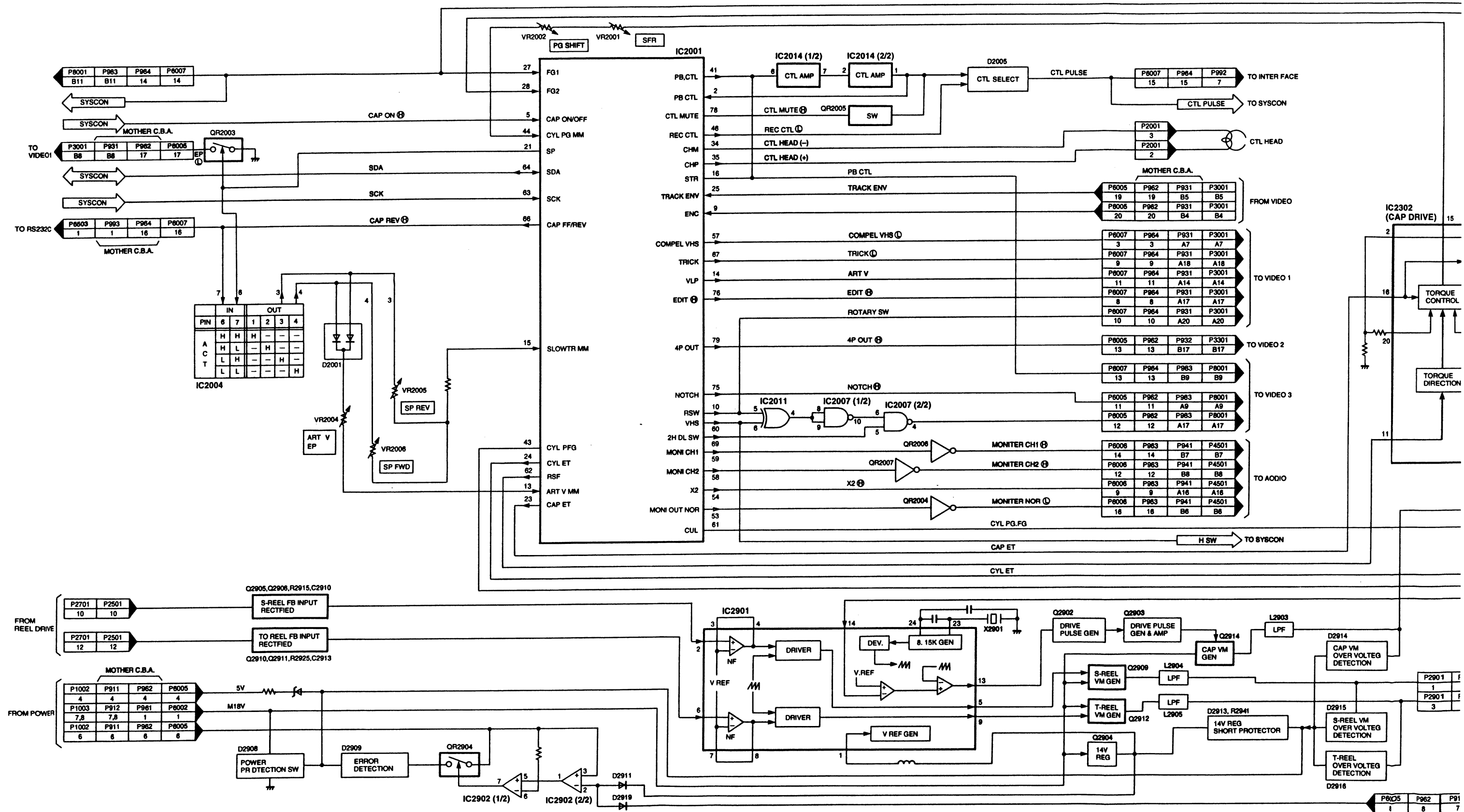


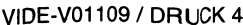
SYSTEM CONTROL BLOCK DIAGRAM



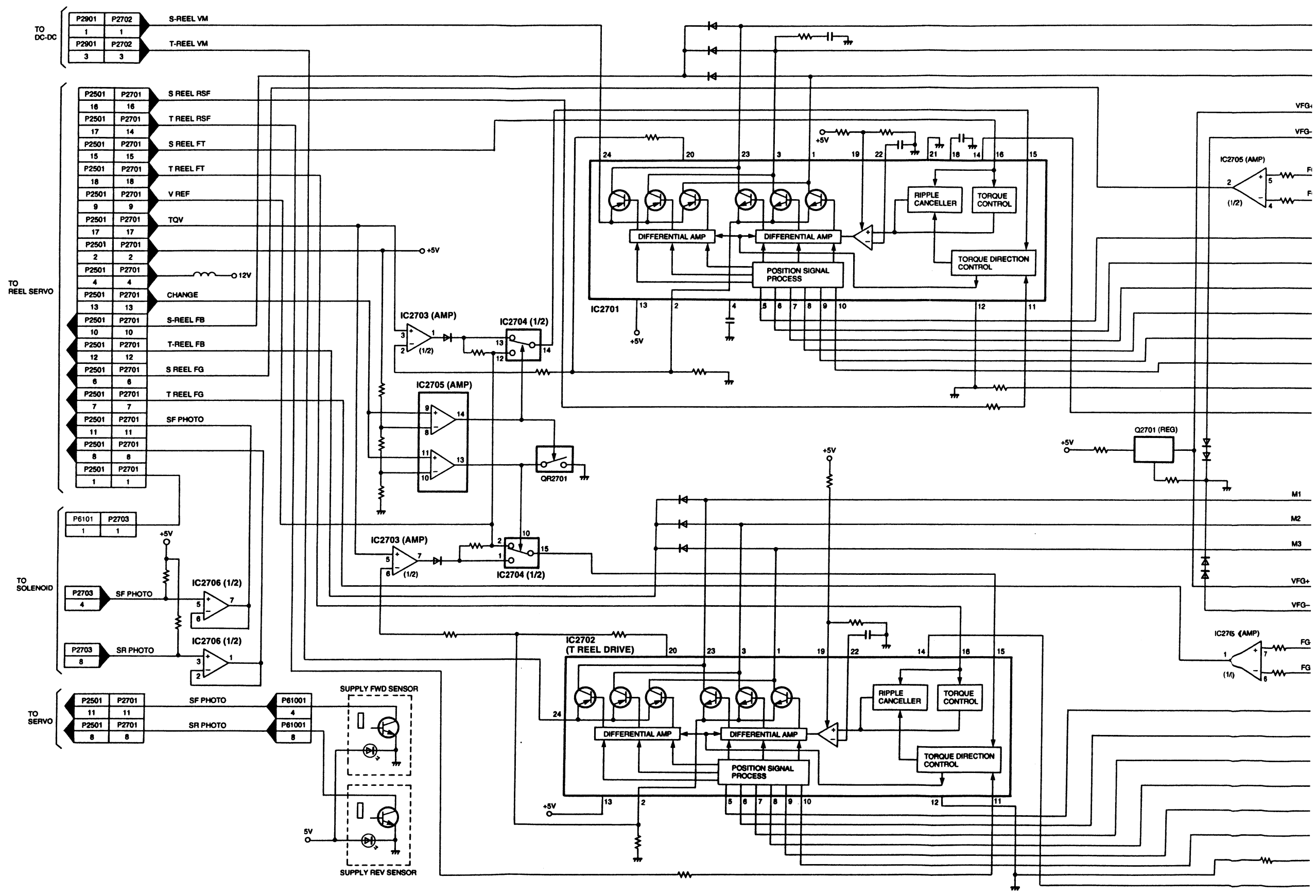


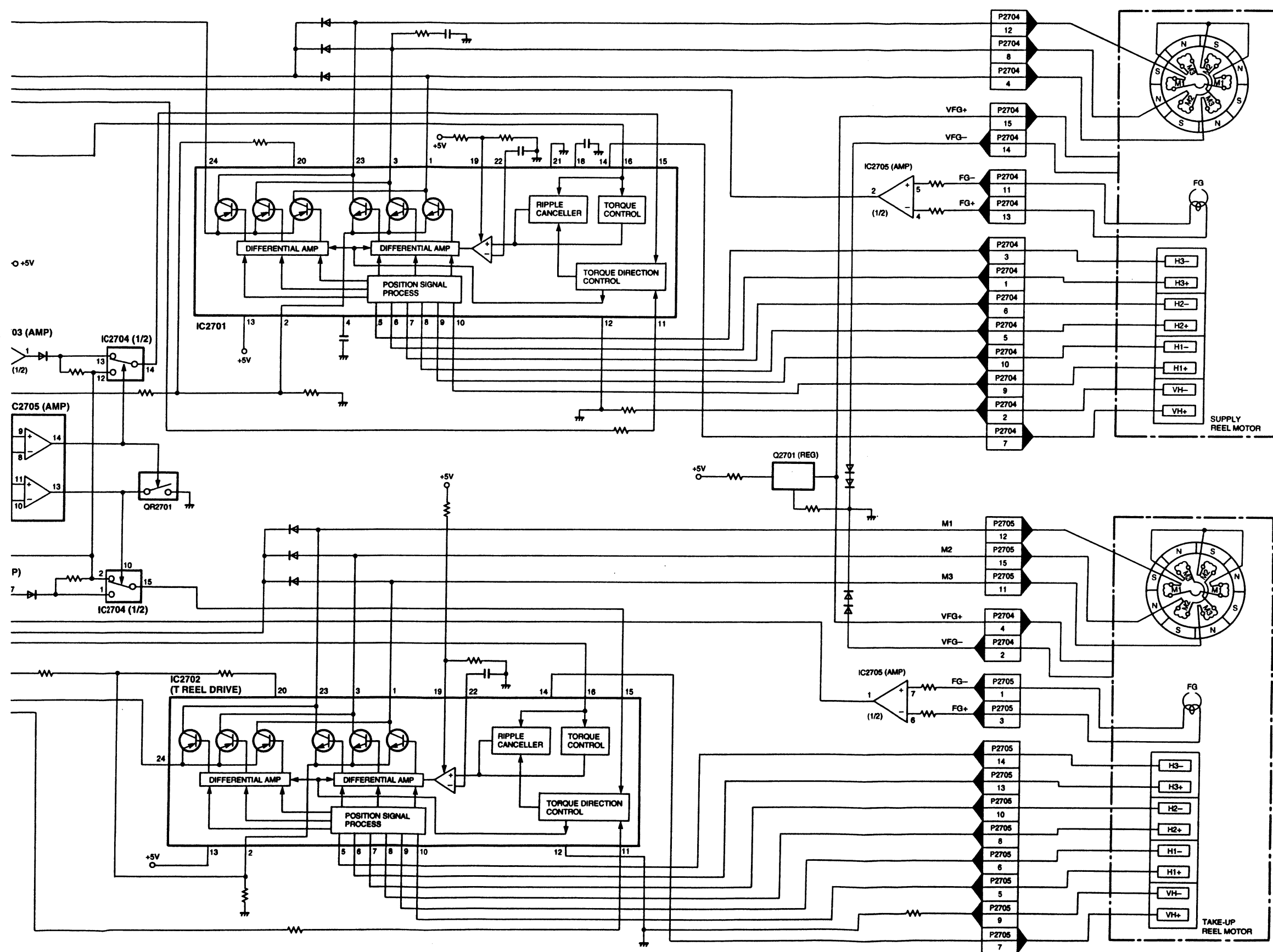
SERVO BLOCK DIAGRAM



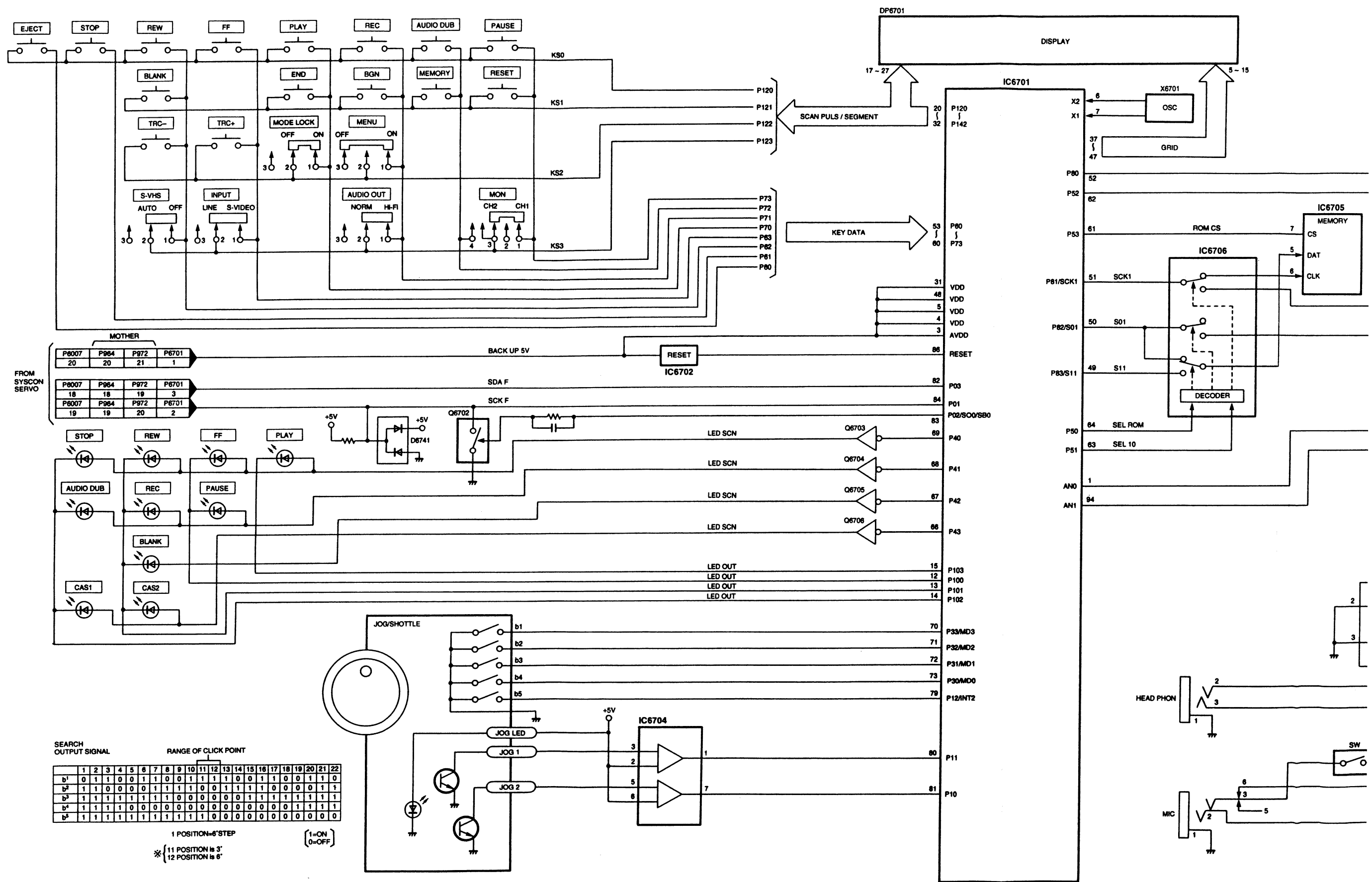


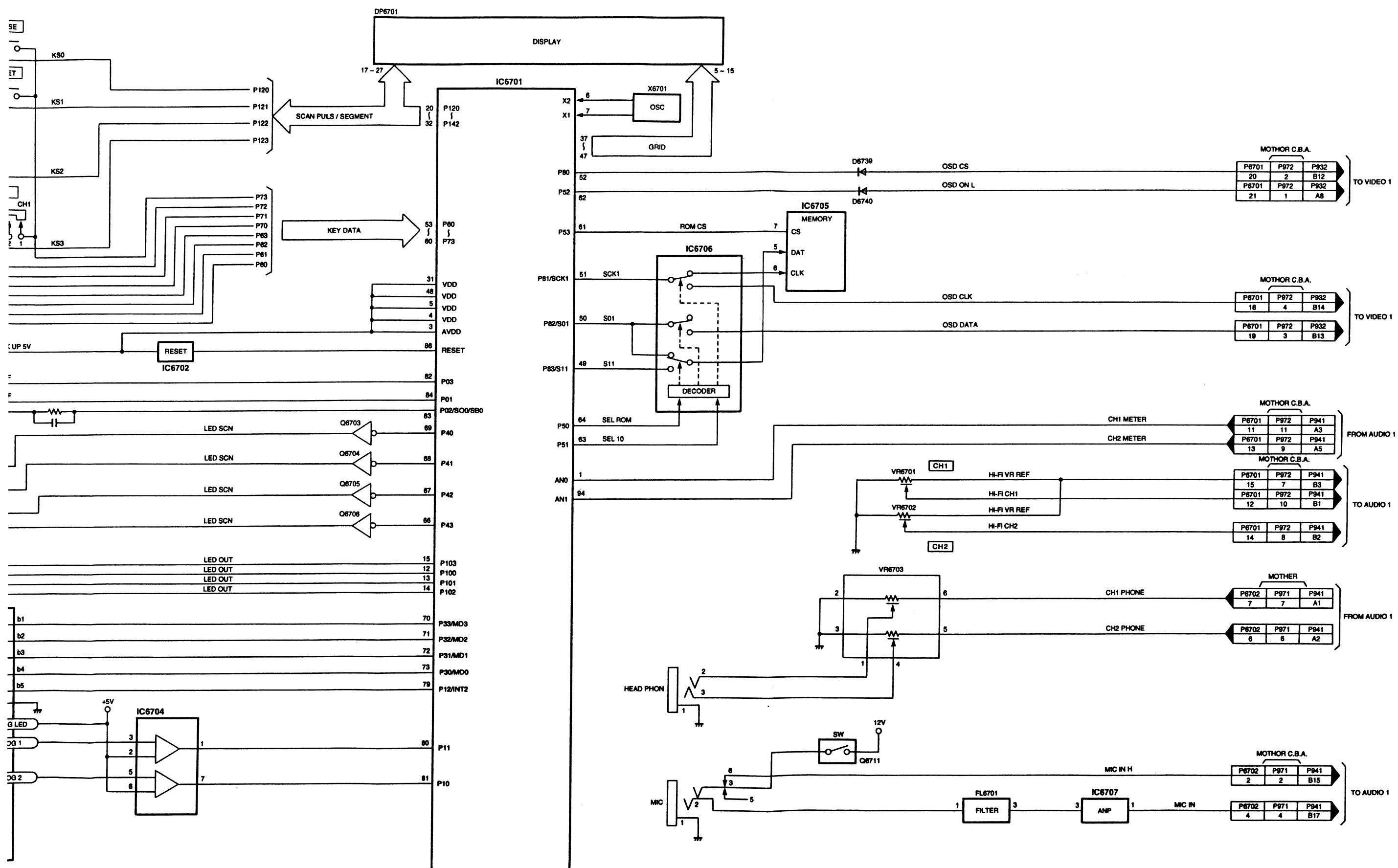
REEL DRIVE BLOCK DIAGRAM



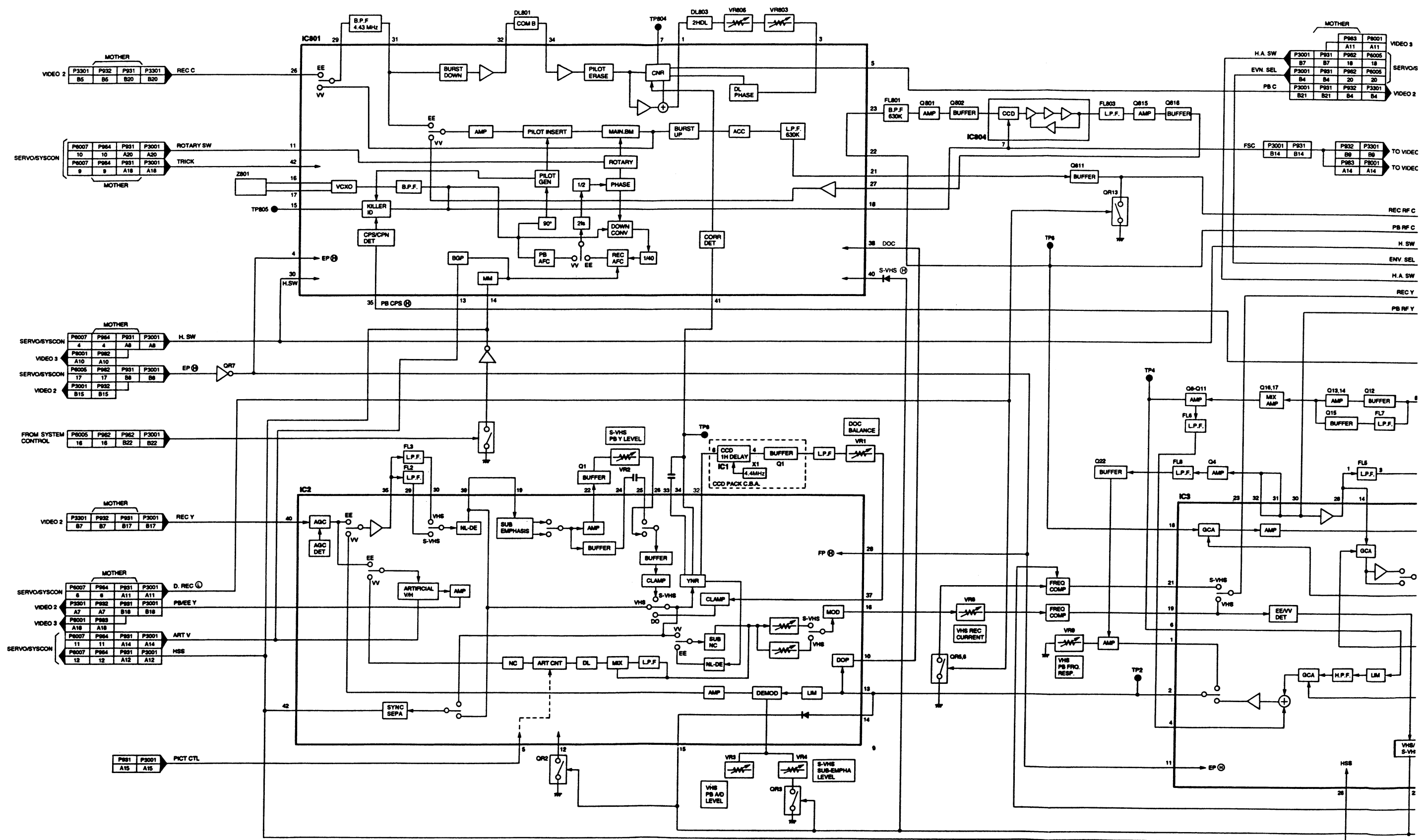


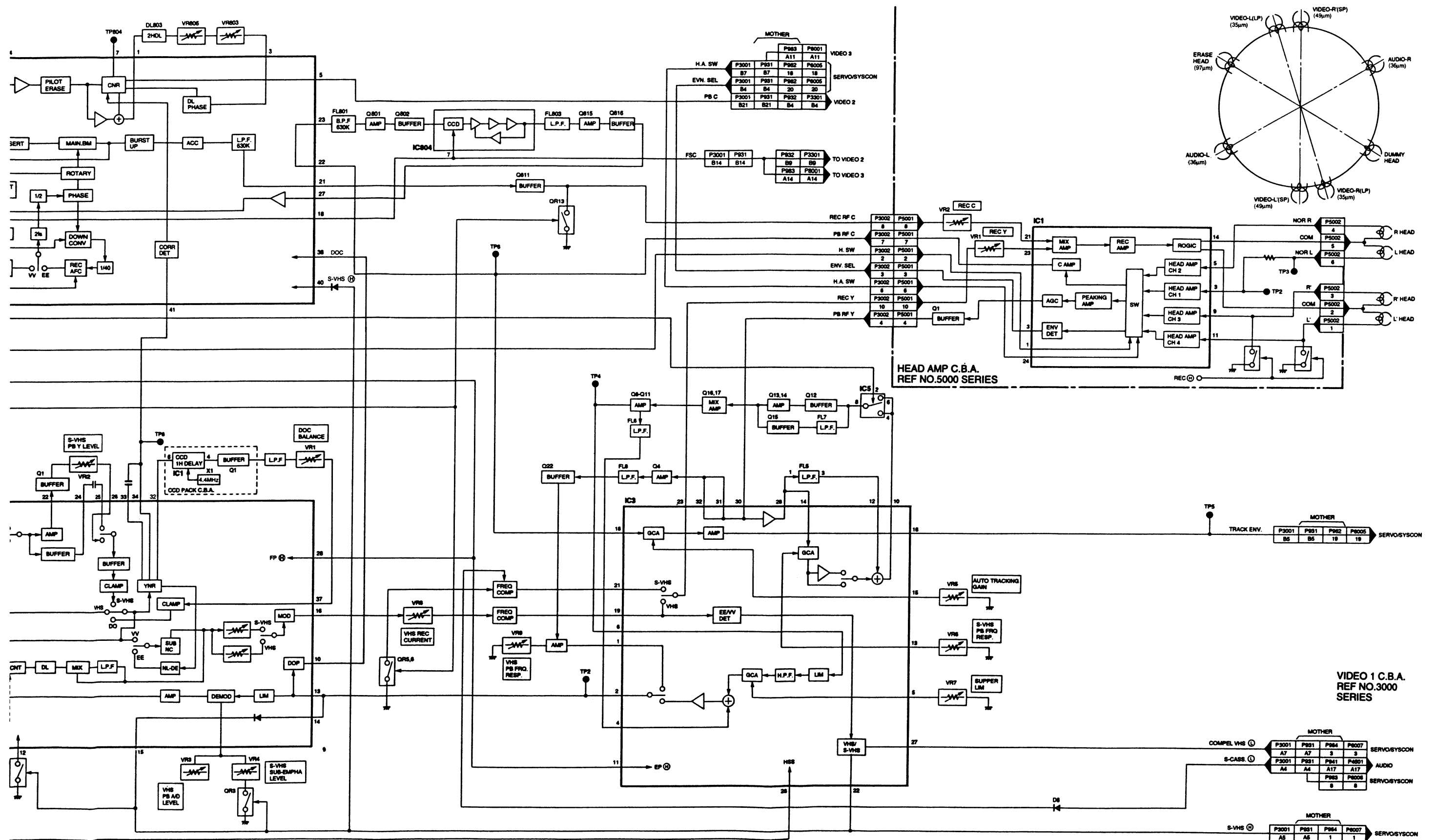
FRONT (1-4) BLOCK DIAGRAM



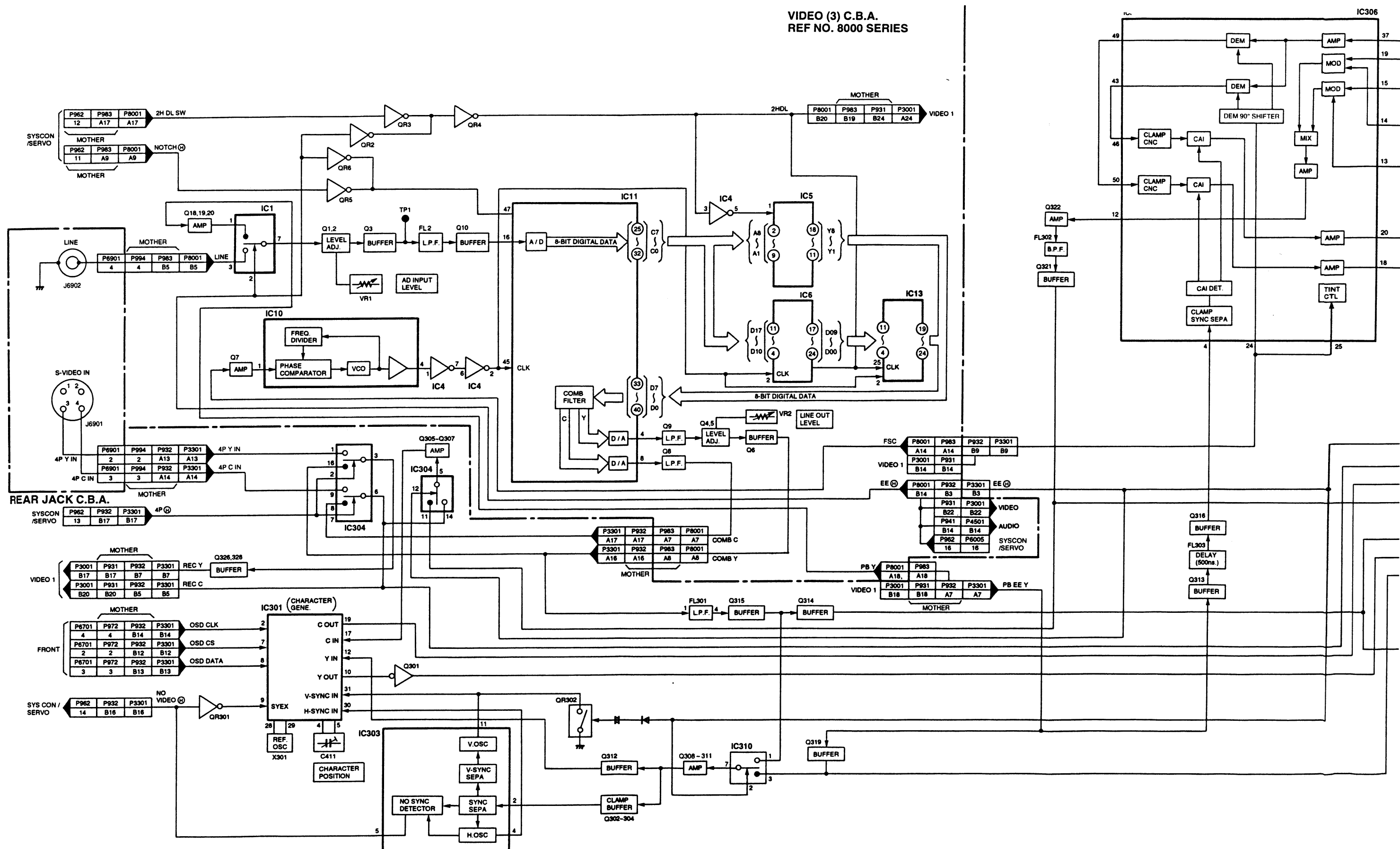


VIDEO 1 BLOCK DIAGRAM

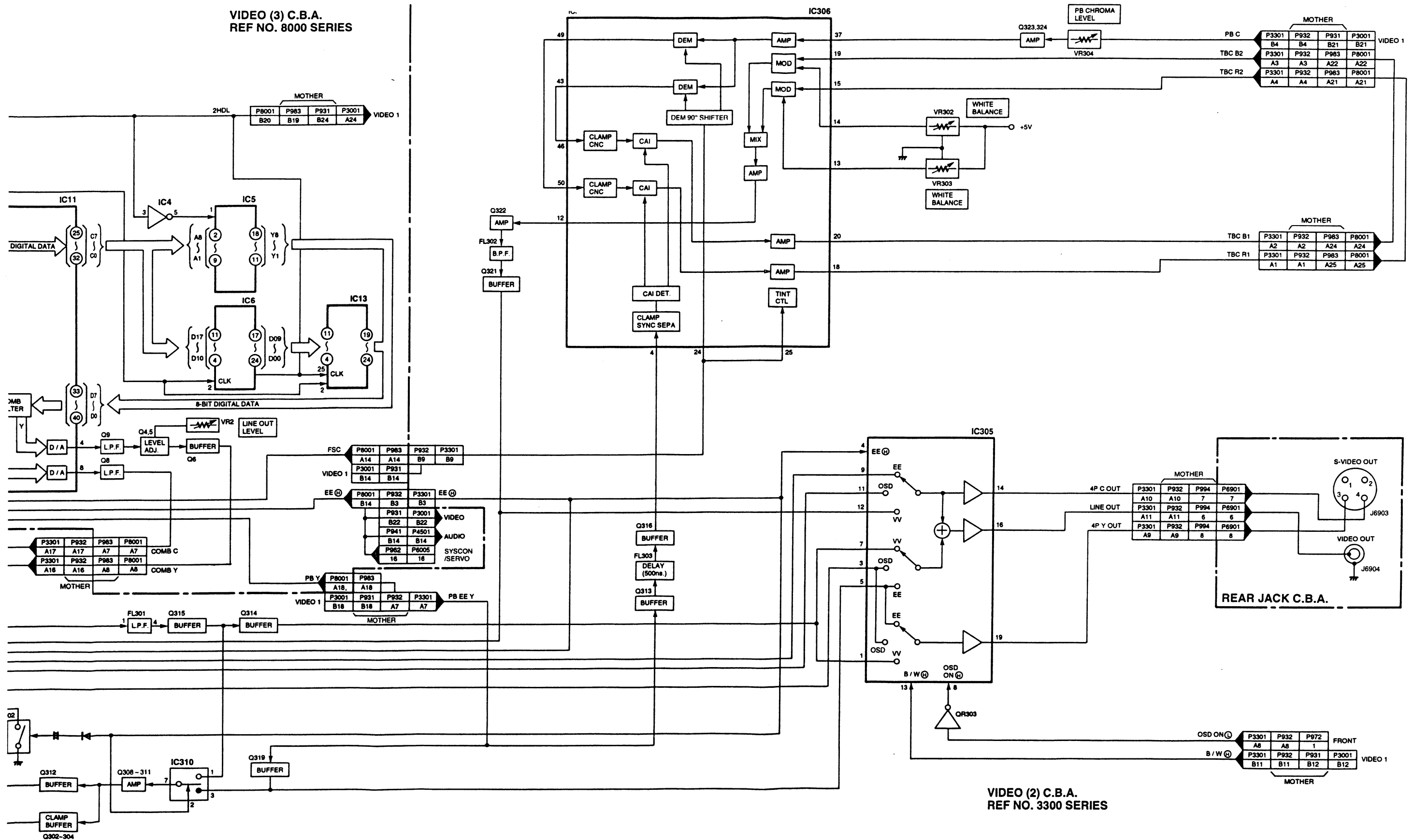




VIDEO 2, 3 BLOCK DIAGRAM

VIDEO (3) C.B.A.
REF NO. 8000 SERIES

**VIDEO (3) C.B.A.
REF NO. 8000 SERIES**

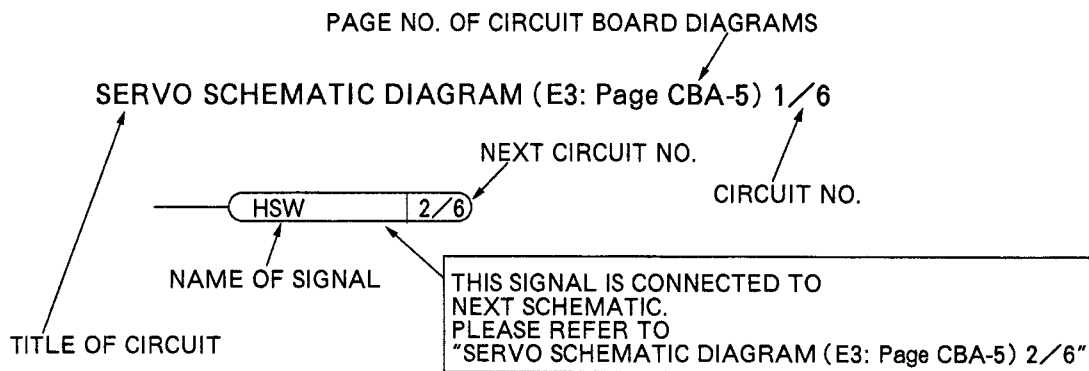


SECTION 6

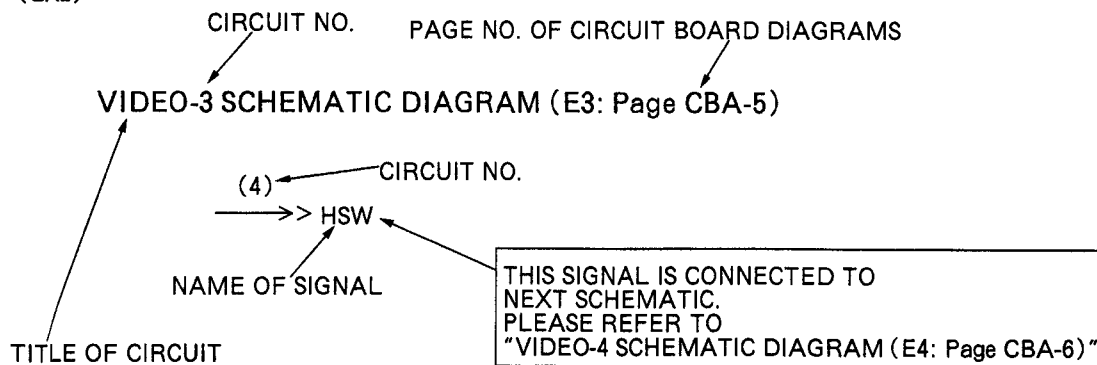
SCHEMATIC DIAGRAMS

NOTE

(EX1)



(EX2)



CONTENTS

POWER SUPPLY (1~3) SCHEMATIC DIAGRAM	SCM-3
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REAR JACK SCHEMATIC DIAGRAM	SCM-26
MOTHER SCHEMATIC DIAGRAM	SCM-27
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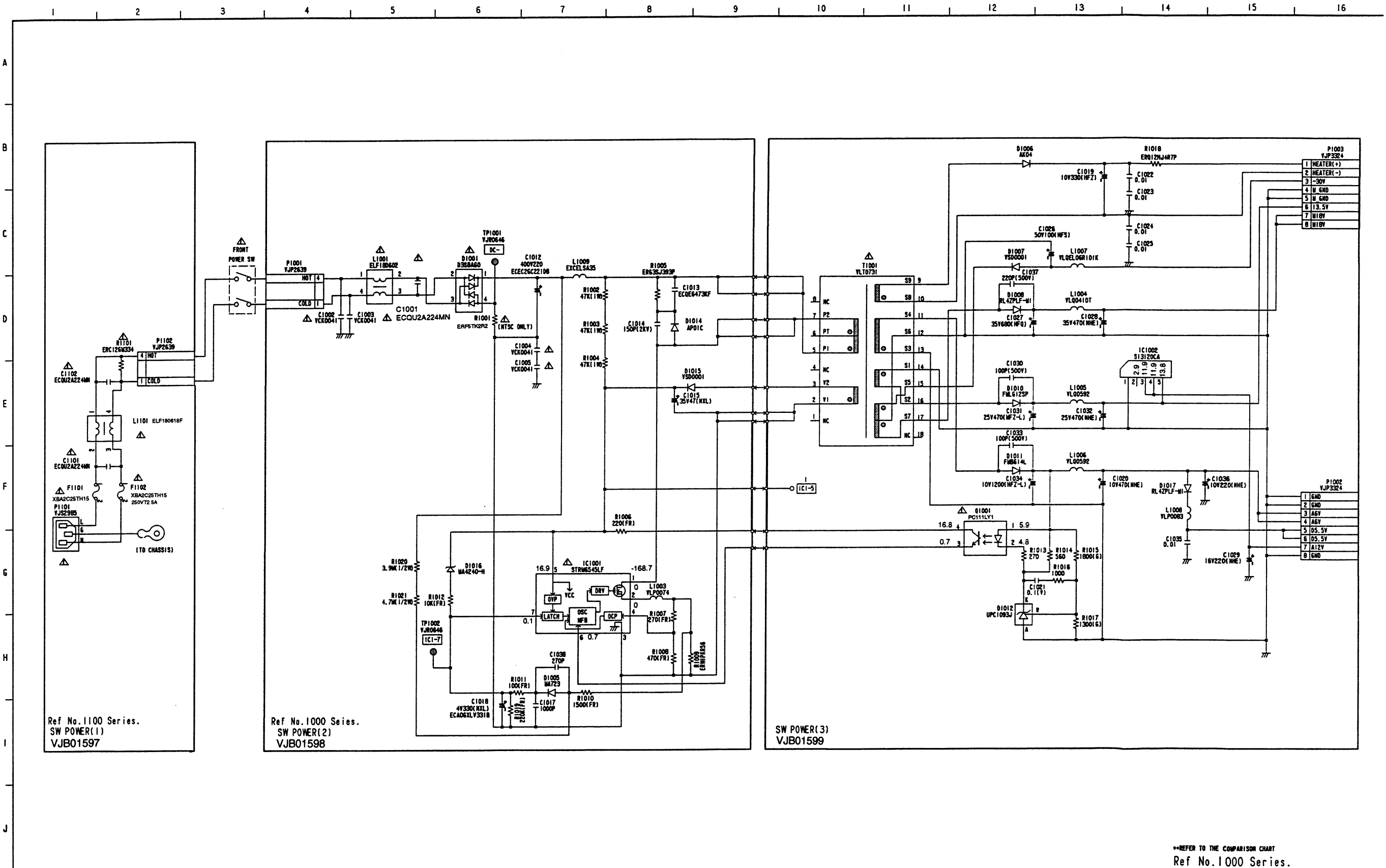
IMPORTANT SAFETY NOTICE

COMPONENTS IDENTIFIED WITH THE MARK \triangle HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

NOTE

DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

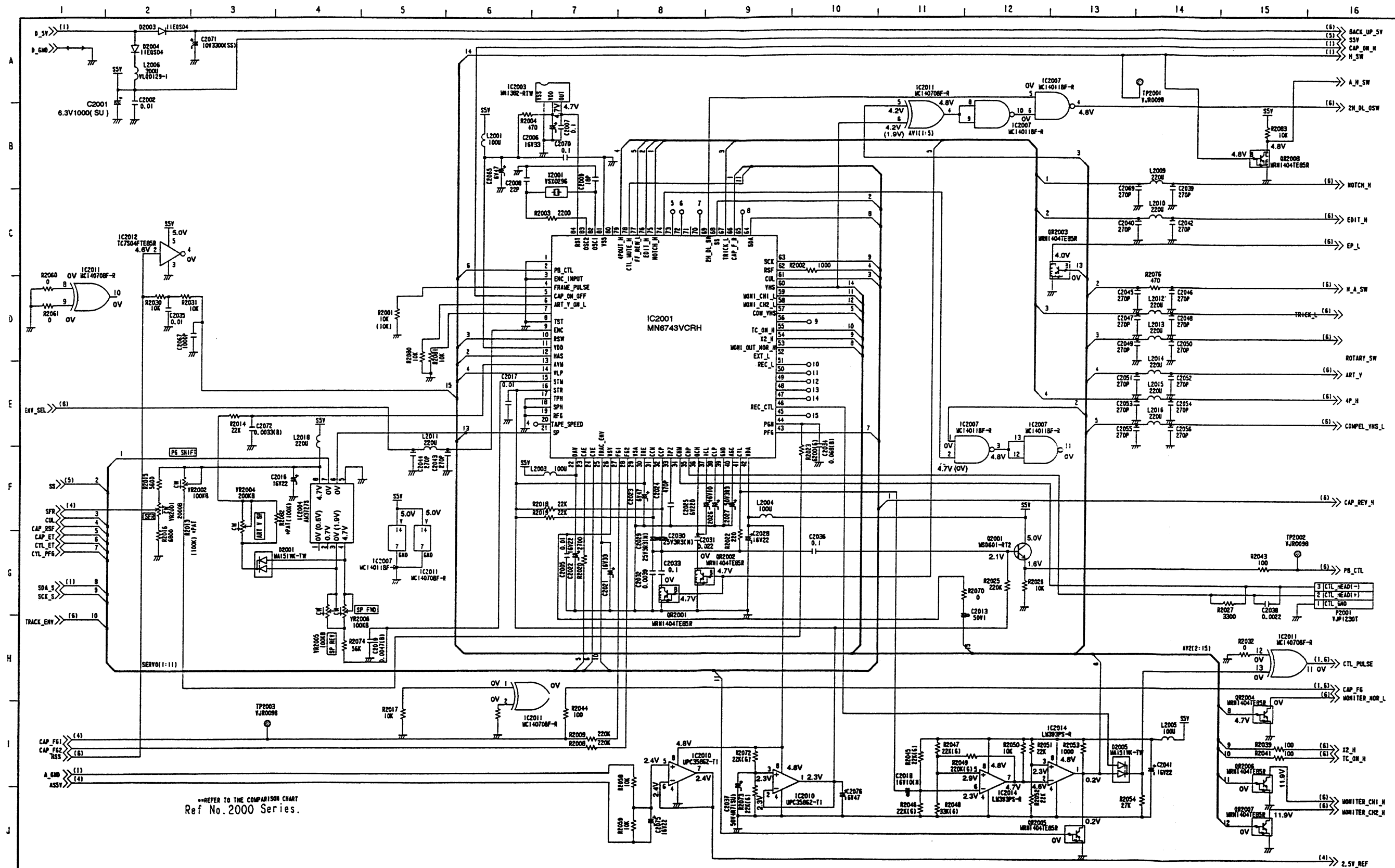
POWER SUPPLY (1~3) SCHEMATIC DIAGRAM (E1,E2,E3: Page CBA-3)



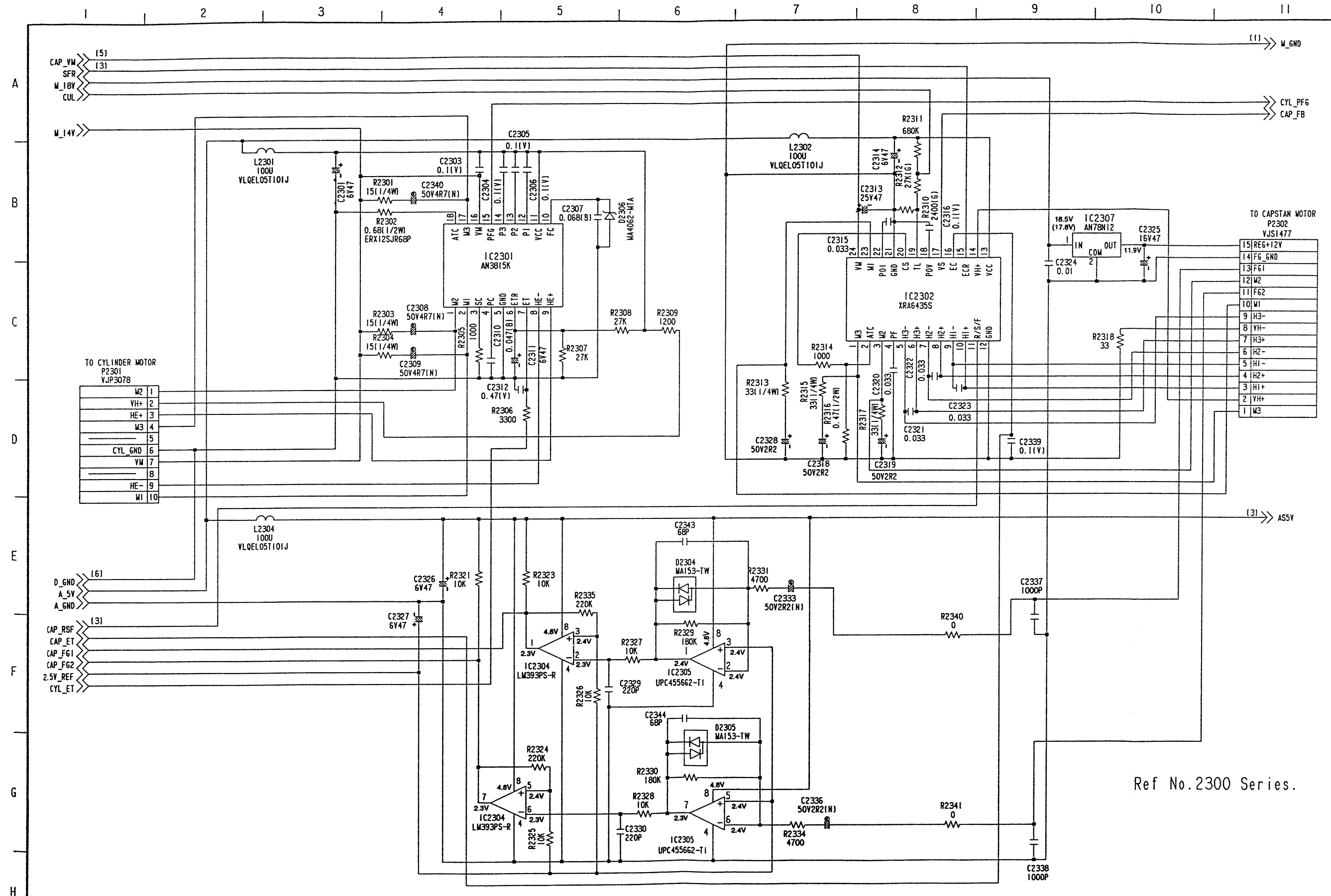
REFER TO THE COMPARISON CHART
Ref No. 1000 Series.

••REFER TO THE COMPARISON CHART
Ref No. 6000 Series.

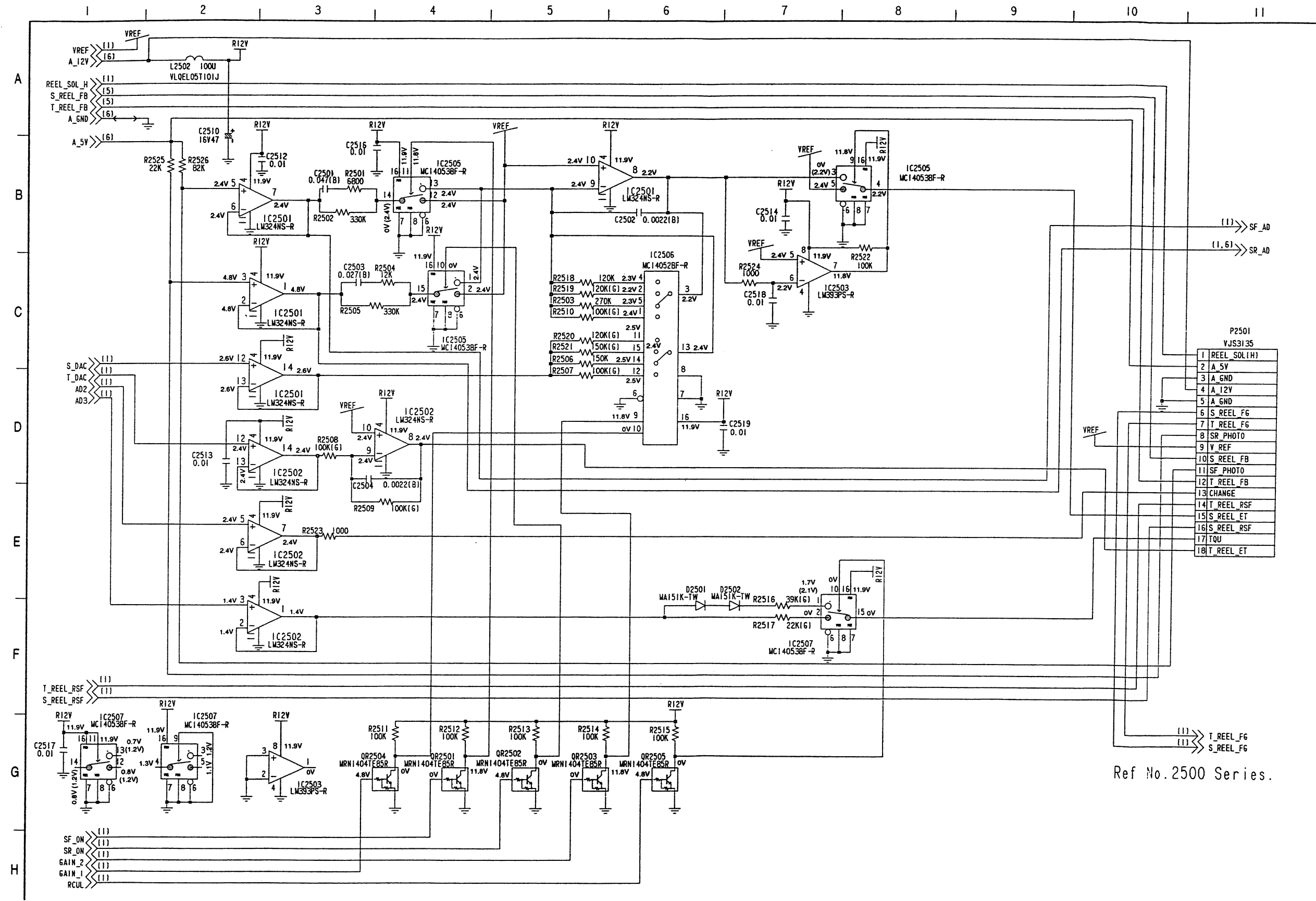
SERVO SCHEMATIC DIAGRAM (E4: Page CBA-5) 3/6



MOTOR DRIVE SCHEMATIC DIAGRAM (E4: Page CBA-5) 4/6



REEL SERVO SCHEMATIC DIAGRAM (E4: Page CBA-5) 2/6



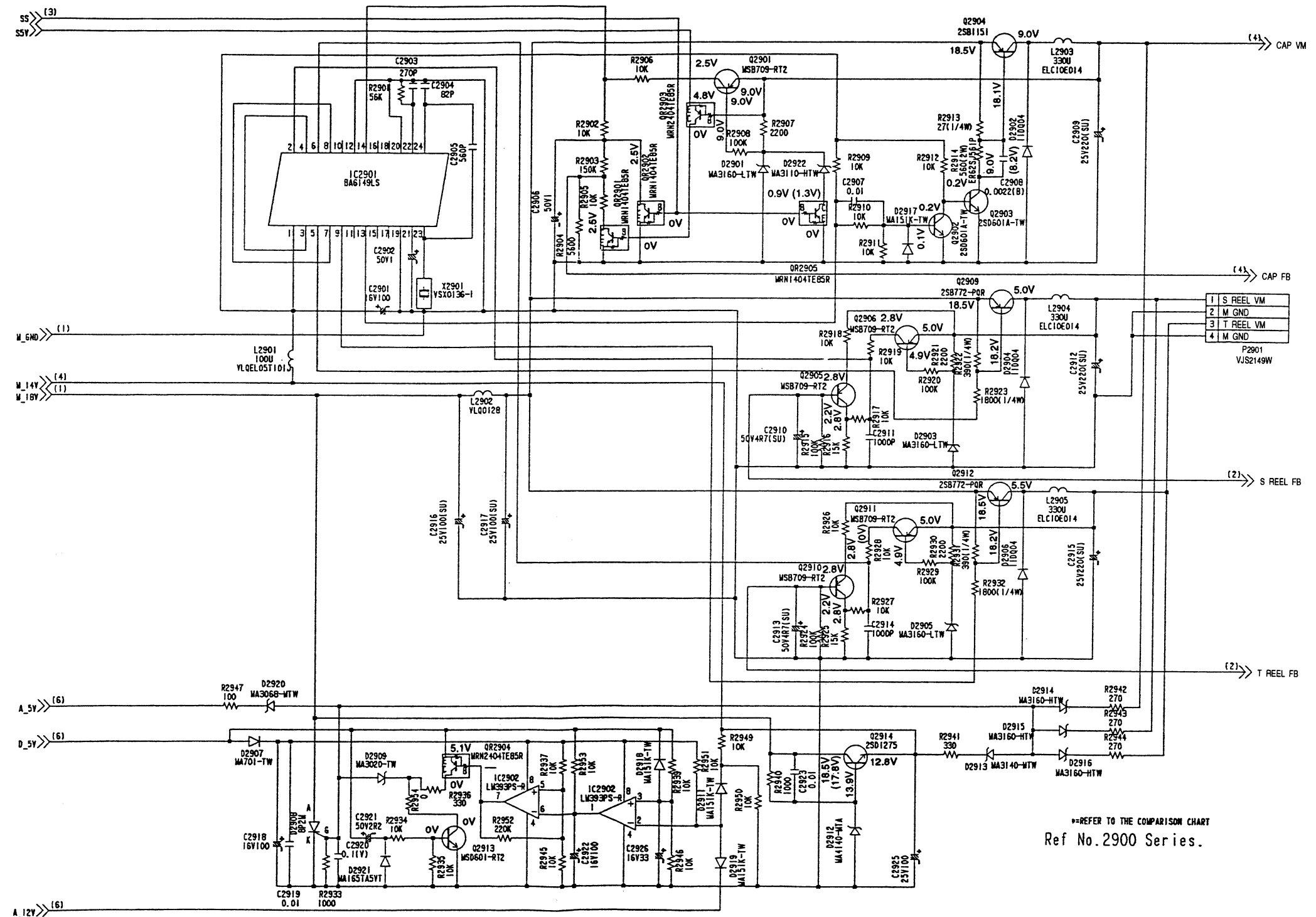
DC-DC CONVERTOR SCHEMATIC DIAGRAM (E4: Page CBA-5)

IC2901

PIN No.	PLAY	REC
1	12.8V	12.8V
2	2.8V	2.8V
3	2.9V	2.9V
4	2.9V	2.9V
5	17.0V	16.4V
6	2.8V	2.8V
7	2.9V	2.9V
8	2.9V	2.9V
9	16.5V	15.5V
10	1.0V	2.0V
11	1.0V	2.0V
12	0V	0V
13	1.5V	1.5V
14	2.5V	2.5V
15	0.5V	0.5V
16	1.2V	2.1V
17	0.5V	0.5V
18	1.2V	2.1V
19	0V	0V
20	0V	0V
21	2.4V	2.4V
22	2.3V	2.3V
23	2.8V	2.8V
24	2.4V	2.4V

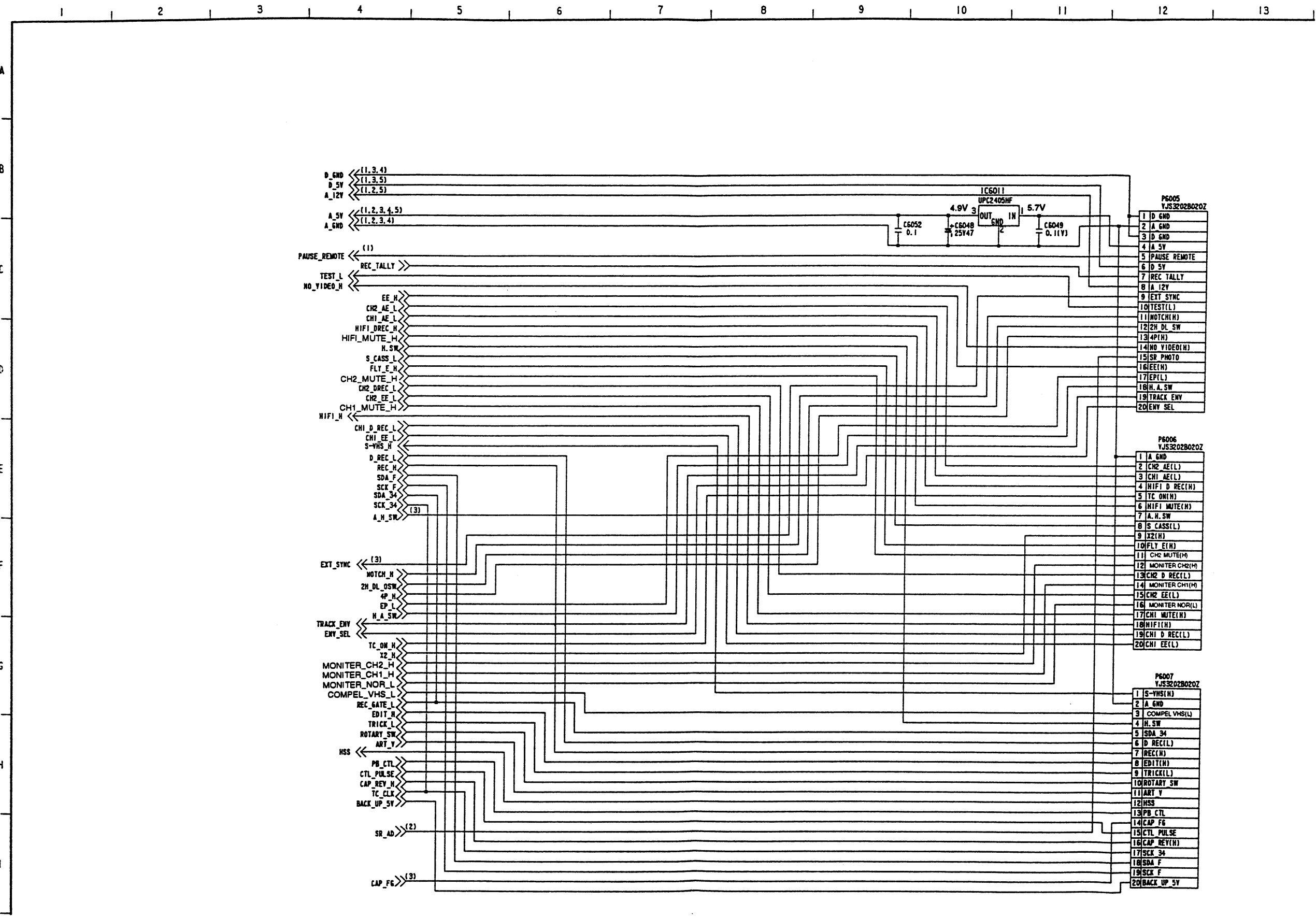
IC2902

PIN No.	PLAY	REC
1	0V	0V
2	4.9V	4.9V
3	2.5V	2.5V
4	0V	0V
5	2.5V	2.5V
6	0V	0V
7	—	—
8	4.9V	4.9V

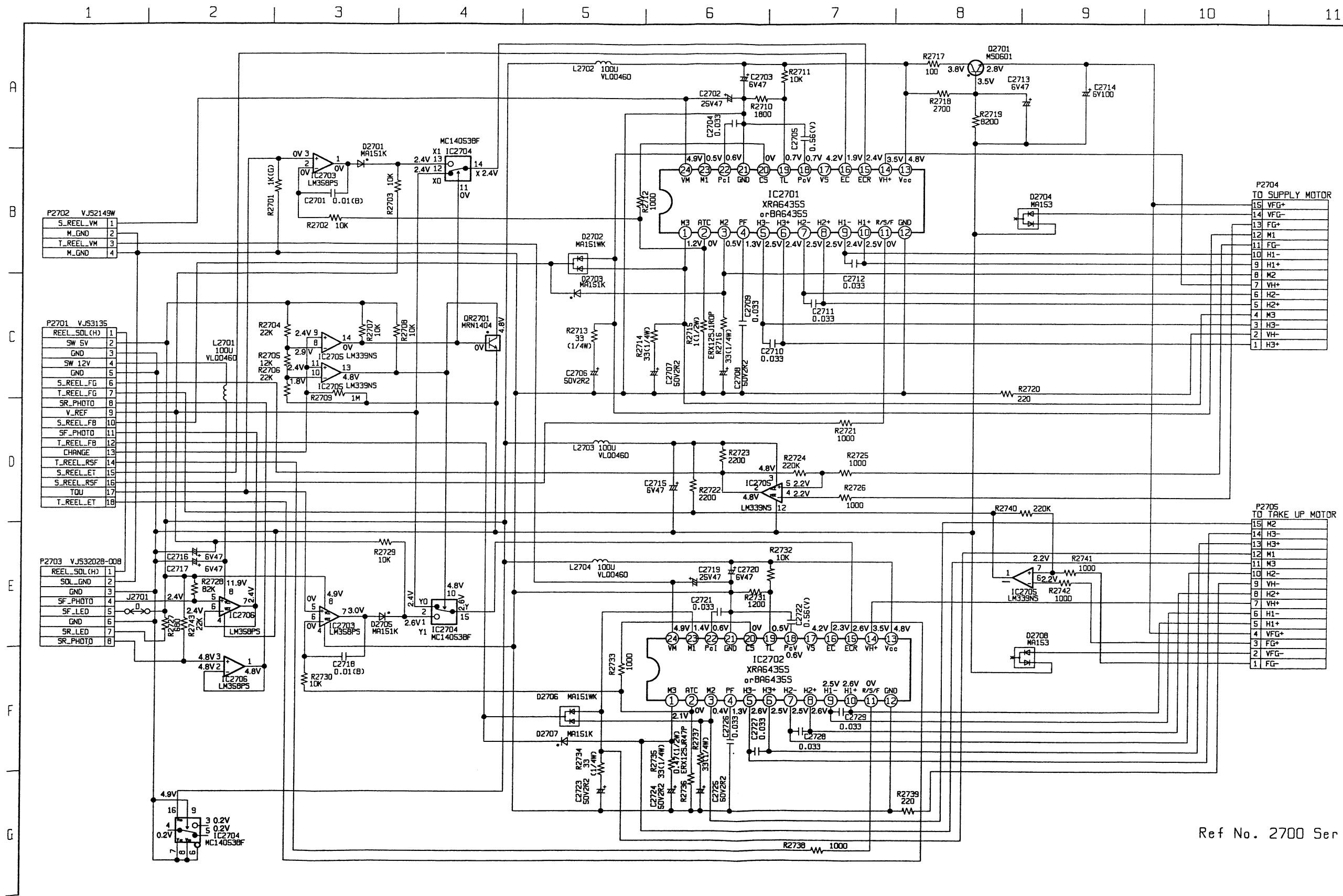


•REFER TO THE COMPARISON CHART
Ref No.2900 Series.

CONNECTION SCHEMATIC DIAGRAM (E4: Page CBA-5) 6/6

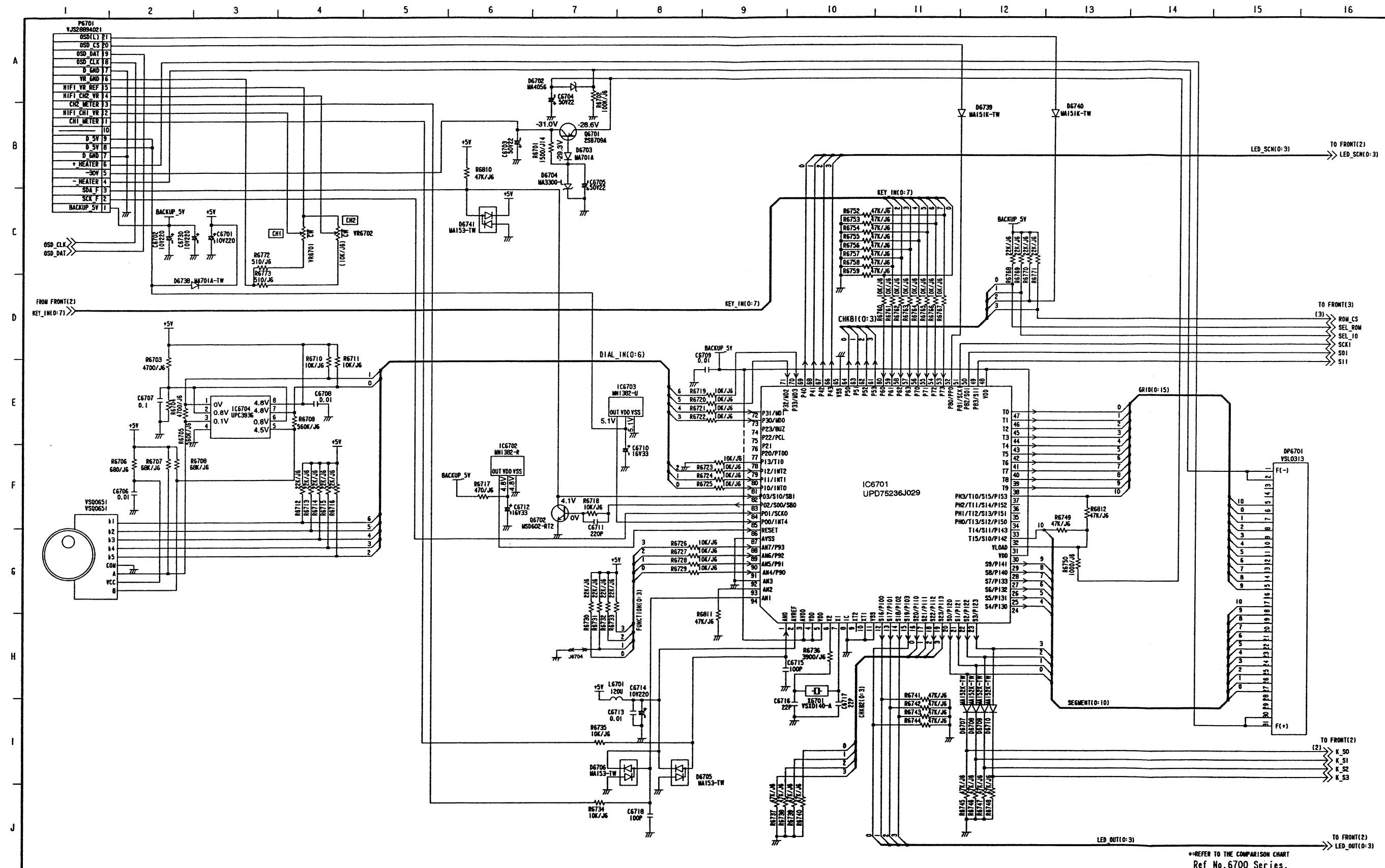


REEL DRIVE SCHEMATIC DIAGRAM (E11: Page CBA-3)



Ref No. 2700 Series.

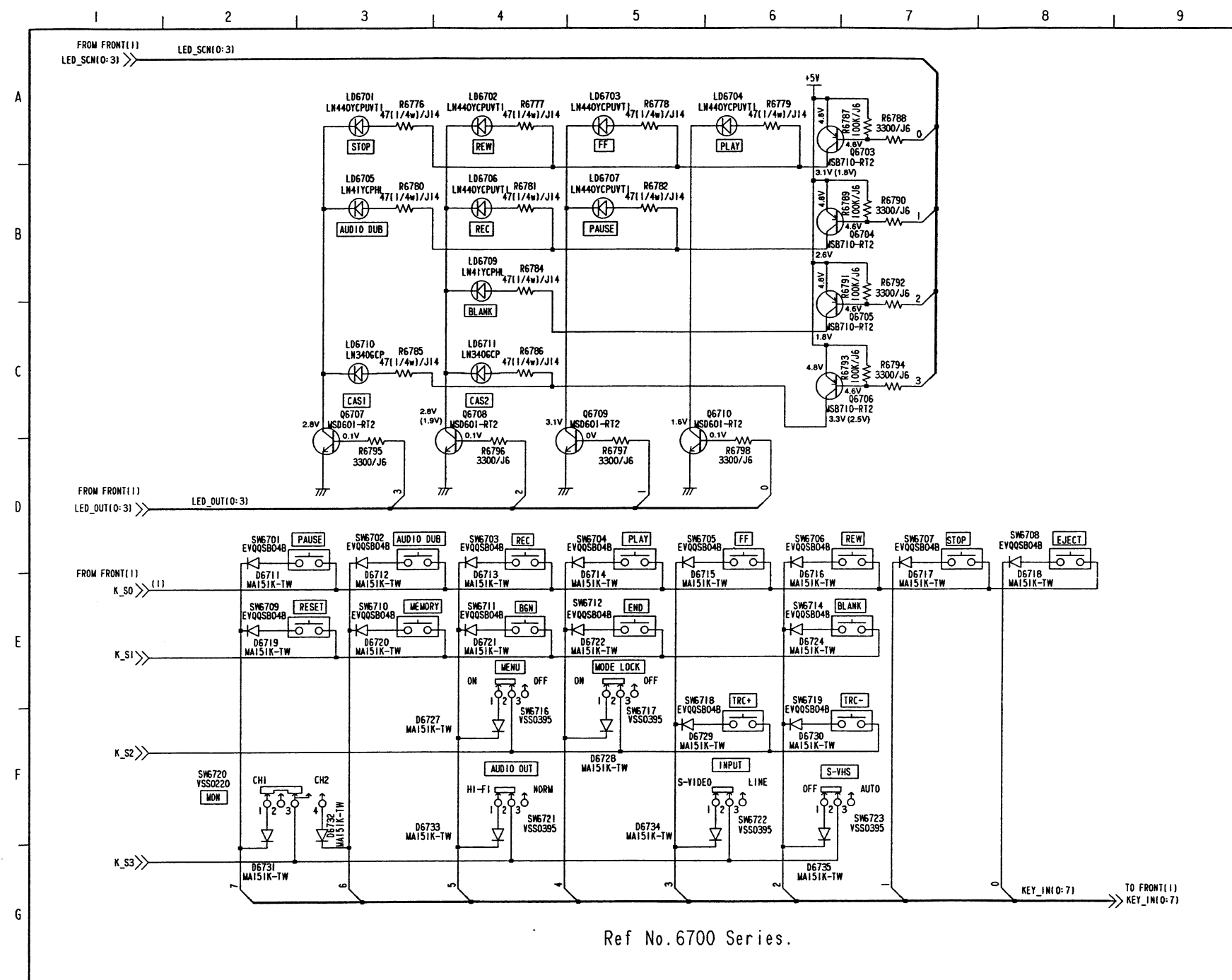
FRONT (1) SCHEMATIC DIAGRAM (E10: Page CBA-4) 1/4



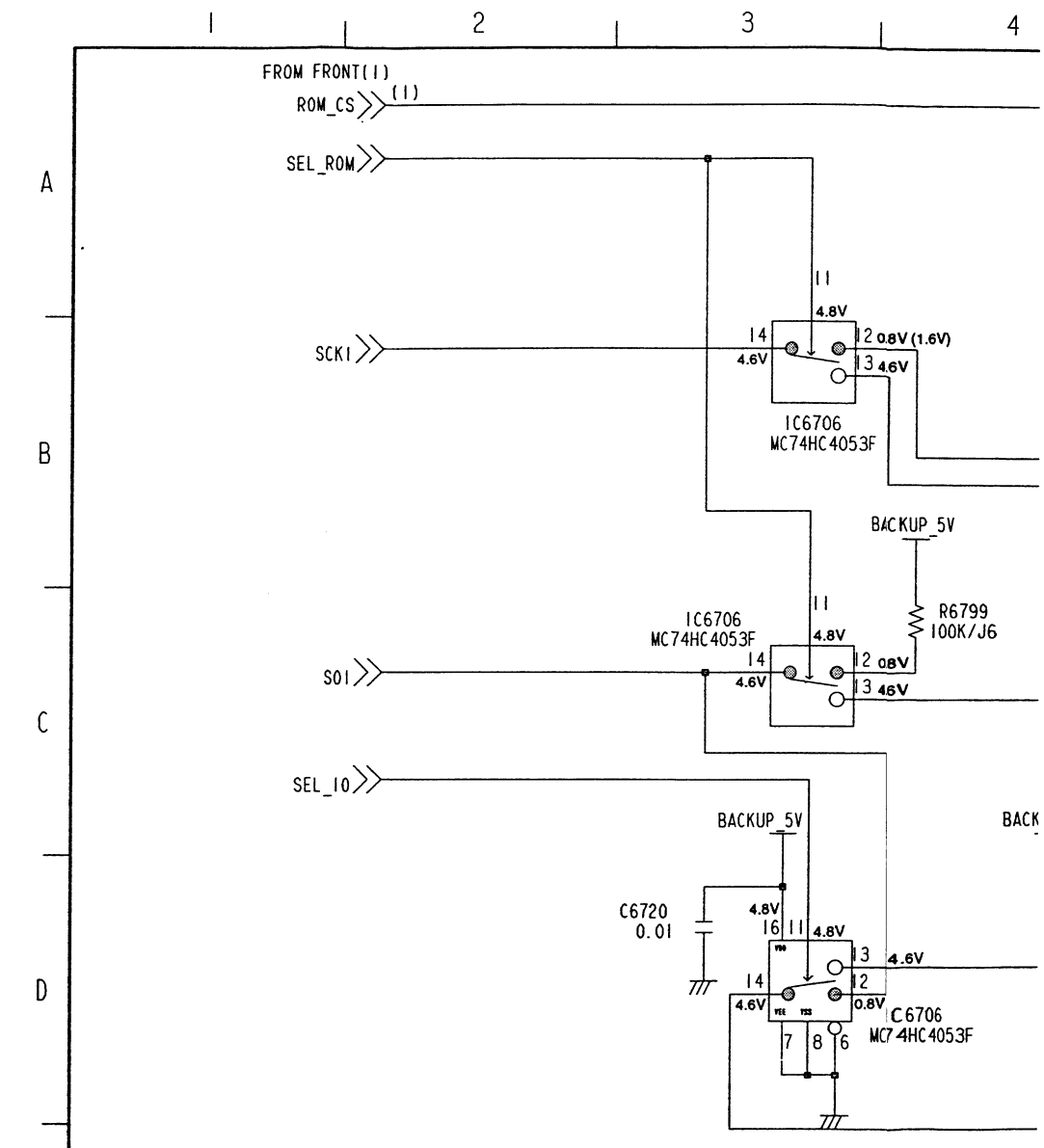
The block diagram illustrates the internal architecture and external connections of the AT89C51F1 microcontroller. The central core includes the Program Counter (15), ALU, CY (Carry Flag), SP (8) (Stack Pointer), SBS (2) (Serial Buffer/Shift Register), BANK, GENERAL REG. (General Registers), RAM DATA MEMORY (768 x 4), ROM PROGRAM MEMORY (16256 x 8), and DECODE AND CONTROL. The CPU CLOCK is derived from the external oscillator circuit (XT1, XT2) and is distributed to the internal components. The microcontroller features various external interfaces and timers: a BASIC INTERVAL TIMER, a TIMER/EVENT COUNTER (with T10/P13 and PT00/P20 inputs), a WATCH TIMER (with BUZ/P23 output), a TIMER/PULSE GENERATOR (with PPO/P80 output), a SERIAL BUS INTERFACE (with SIO/SB1/P03, SO/SB0/P02, and SCK0/P01 inputs), a SERIAL INTERFACE (with Si1/P83, SO1/P82, and SCK1/P81 inputs), an INTERRUPT CONTROL (with INT0/P10, INT1/P11, INT2/P12, and INT4/P00 inputs), an EVENT COUNTER (with T10 input), an A/D CONVERTER (with AN0, AN3, AN4/P90-AN7/P93 inputs and AVcc, AVss, AVref inputs), and a BIT SEQ. BUFFER (16). The microcontroller also includes a FIP CONTROLLER DRIVER (with T0-T9, T10/S15/PH3/P153, T13/S12/PH0/P150, T14/S11/P143, T15/S10/P142, S0/P120-S9/P141, S16/P100-S23/P113, and Vcc inputs) and a PORT10,15 (24-bit output). The external connections include PORT0-P03, PORT1-P10-P13, PORT2-P20-P23, PORT3-P30-P33, PORT4-P40-P43, PORT5-P50-P53, PORT6-P60-P63, PORT7-P70-P73, PORT8-P80-P83, PORT9-P90-P93, and PORT10,15-P100-P153. The microcontroller is powered by Vcc and Vss, and has a RESET pin.

PIN No.	PLAY	REC	PIN No.	PLAY	REC	PIN No.	PLAY	REC
1	0.2V	0V	33	0V	0V	65	0V	0V
2	4.8V	4.8V	34	0V	0V	66	3.7V	3.7V
3	4.8V	4.8V	35	0V	0V	67	3.6V	3.6V
4	4.8V	4.8V	36	0V	0V	68	3.7V	3.7V
5	4.8V	4.8V	37	-23.0V	-23.0V	69	3.7V	3.7V
6	2.3V	2.3V	38	-23.0V	-23.0V	70	0V	0V
7	2.1V	2.1V	39	-23.3V	-23.3V	71	4.8V	4.8V
8	0V	0V	40	-24.0V	-24.0V	72	4.8V	4.8V
9	4.8V	4.8V	41	-23.7V	-23.7V	73	4.8V	4.8V
10	0V	0V	42	-23.0V	-23.0V	74	0V	0V
11	0V	0V	43	-23.0V	-23.0V	75	2.1V	2.1V
12	0V	0V	44	-23.0V	-23.0V	76	0V	0V
13	4.5V	2.3V	45	-23.0V	-23.0V	77	0V	0V
14	4.5V	1.2V	46	-23.2V	-23.2V	78	0V	0V
15	0V	1.0V	47	-23.2V	-23.2V	79	4.8V	4.8V
16	0V	0V	48	4.8V	4.8V	80	0V	0V
17	0V	0V	49	4.8V	4.8V	81	4.8V	4.8V
18	0V	0V	50	0.1V	0.1V	82	4.0V	4.0V
19	0V	0V	51	4.7V	4.7V	83	0.6V	0.6V
20	-8.0V	-8.0V	52	4.4V	3.9V	84	4.5V	4.5V
21	-14.6V	-10.0V	53	0V	0V	85	5.1V	5.1V
22	-10.7V	-8.0V	54	0V	0V	86	4.8V	4.8V
23	-10.9V	-10.9V	55	0V	0V	87	0V	0V
24	-10.0V	-10.0V	56	0V	0V	88	4.8V	4.8V
25	-10.0V	-15.0V	57	0V	0V	89	4.8V	4.8V
26	-17.5V	-16.0V	58	2.7V	2.7V	90	0V	0V
27	-25.8V	-26.2V	59	0V	0V	91	4.8V	4.8V
28	-18.7V	-18.7V	60	0V	0V	92	0V	0V
29	-8.9V	-8.9V	61	0V	0V	93	0V	0V
30	4.8V	4.8V	62	4.8V	4.8V	94	1.5V	0V
31	-26.0V	-26.0V	63	0V	0V			
32	-23.7V	-23.7V	64	4.8V	4.8V			

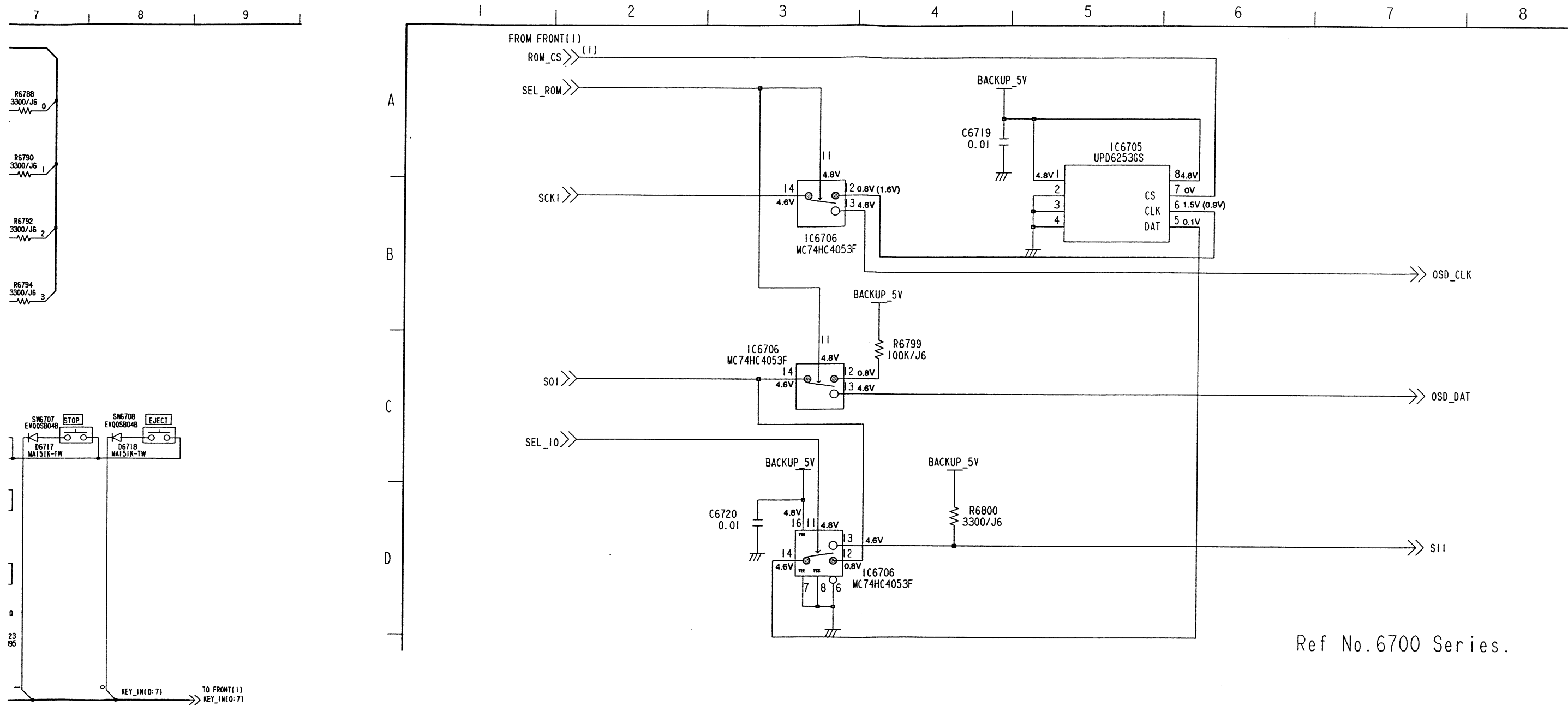
FRONT (2) SCHEMATIC DIAGRAM (E10: Page CBA-4) 2/4



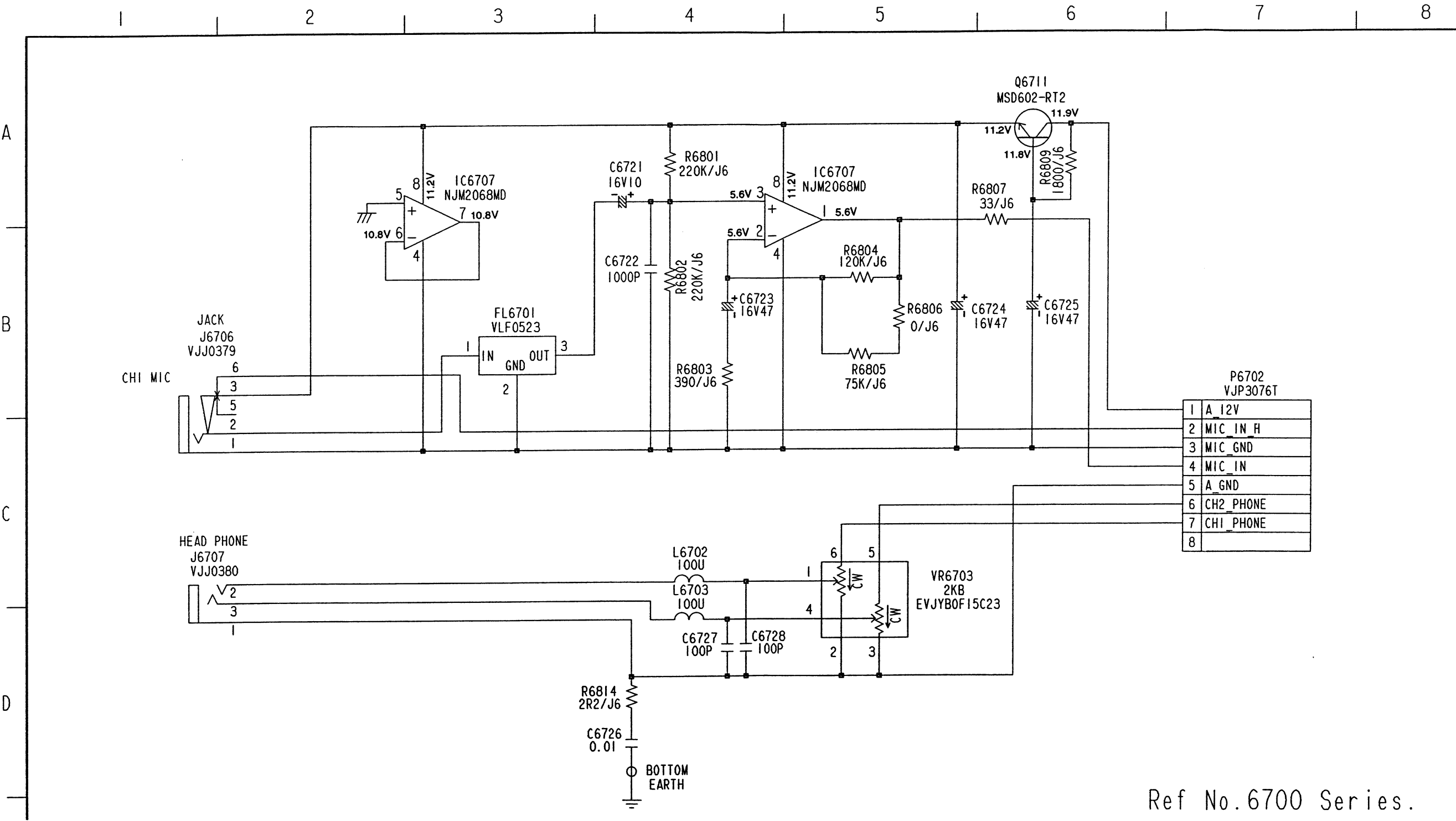
FRONT (3) SCHEMATIC DIAGRAM (E10: Page CBA-4) 3/4



FRONT (3) SCHEMATIC DIAGRAM (E10: Page CBA-4) 3/4

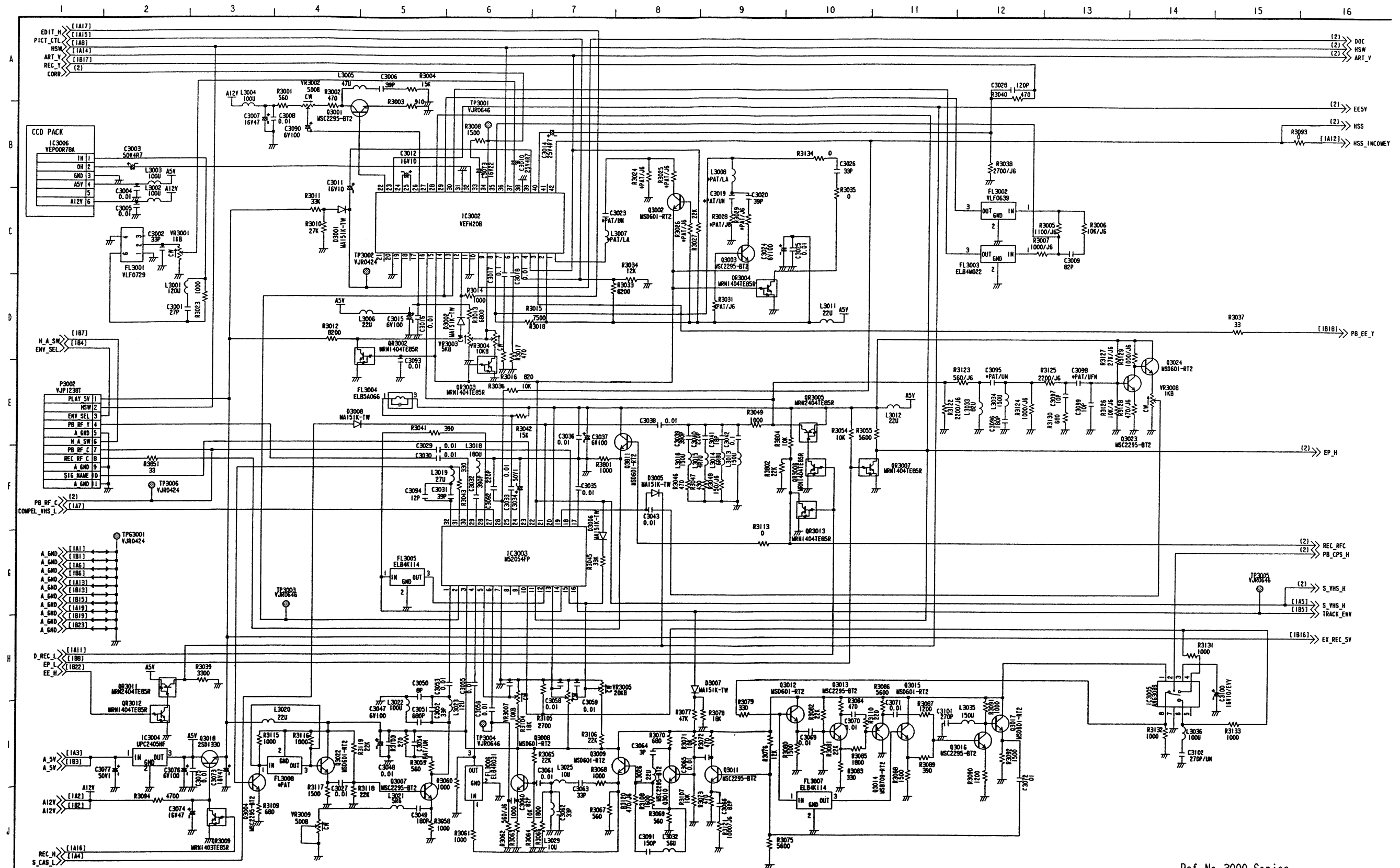


FRONT (4) SCHEMATIC DIAGRAM (E10: Page CBA-4) 4/4



Ref No.6700 Series.

VIDEO (1) SCHEMATIC DIAGRAM (E5: Page CBA-7) 1/2



Ref No.3000 Series.

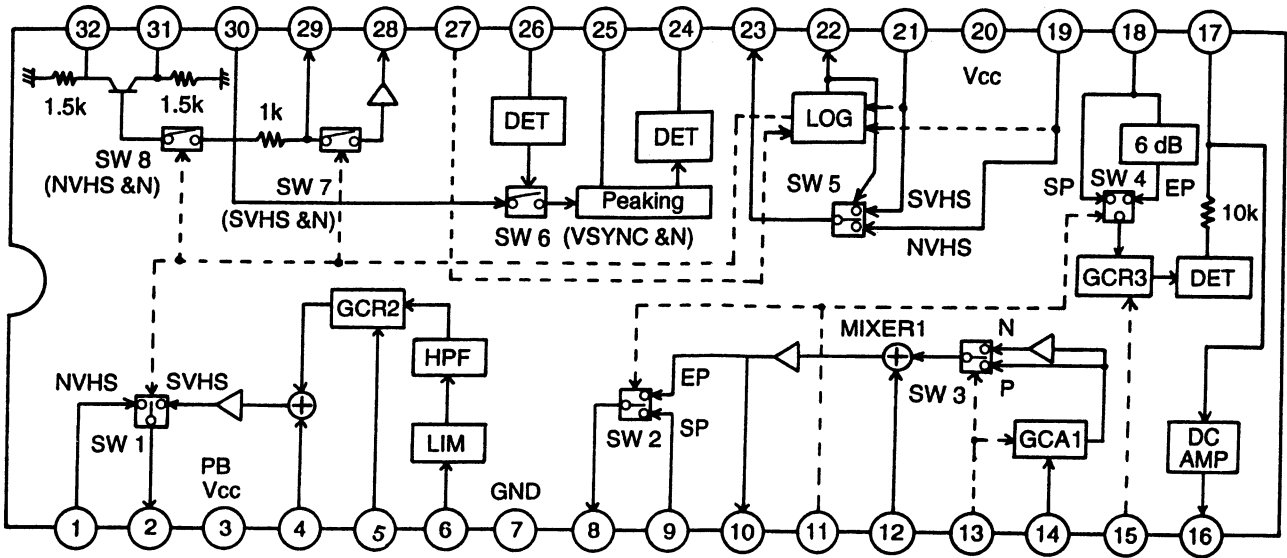
VIDEO 1 ICs DC VOLTAGE

REF NO.	IC3002															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	2.9	4.8	2.3	0	2.8	1.9	1.3	1.7	1.0	4.8	0	2.3	2.5	2.5	0.2	4.8
REC	2.9	4.8	2.3	0	2.8	1.9	4.3	1.7	1.0	1.2	0	0	0	0	0.2	3.4
REF NO.	IC3002															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	4.8	3.0	1.8	0	4.8	3.2	0.5	1.2	2.9	2.8	4.8	0	1.8	1.8	0	1.4
REC	4.8	3.0	1.8	0	2.1	3.2	4.9	1.2	2.9	2.8	4.8	0	1.8	1.8	0	1.4
REF NO.	IC3002															
PIN NO.	33	34	35	36	37	38	39	40	41	42						
PLAY	2.7	2.0	1.7	4.7	2.1	0	2.3	3.3	0.3	0.4						
REC	2.7	2.0	2.0	4.7	2.1	0	2.3	2.8	0.3	0.4						
REF NO.	IC3003															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	3.9	2.5	0	0	0.7	3.2	0	1.3	2.8	1.9	0	2.5	2.6	2.5	1.4	2.0
REC	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REF NO.	IC3003															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	3.1	2.8	1.0	4.9	4.5	0.1	0.3	2.7	3.9	0.4	4.8	2.5	1.9	3.3	1.2	3.4
REC	0	0	2.4	4.9	4.5	0	1.6	2.5	4.3	0.4	4.8	0	0	0	0	0
REF NO.	IC3004															
PIN NO.	1	2	3													
PLAY	5.7	0	4.9													
REC	5.7	0	4.9													

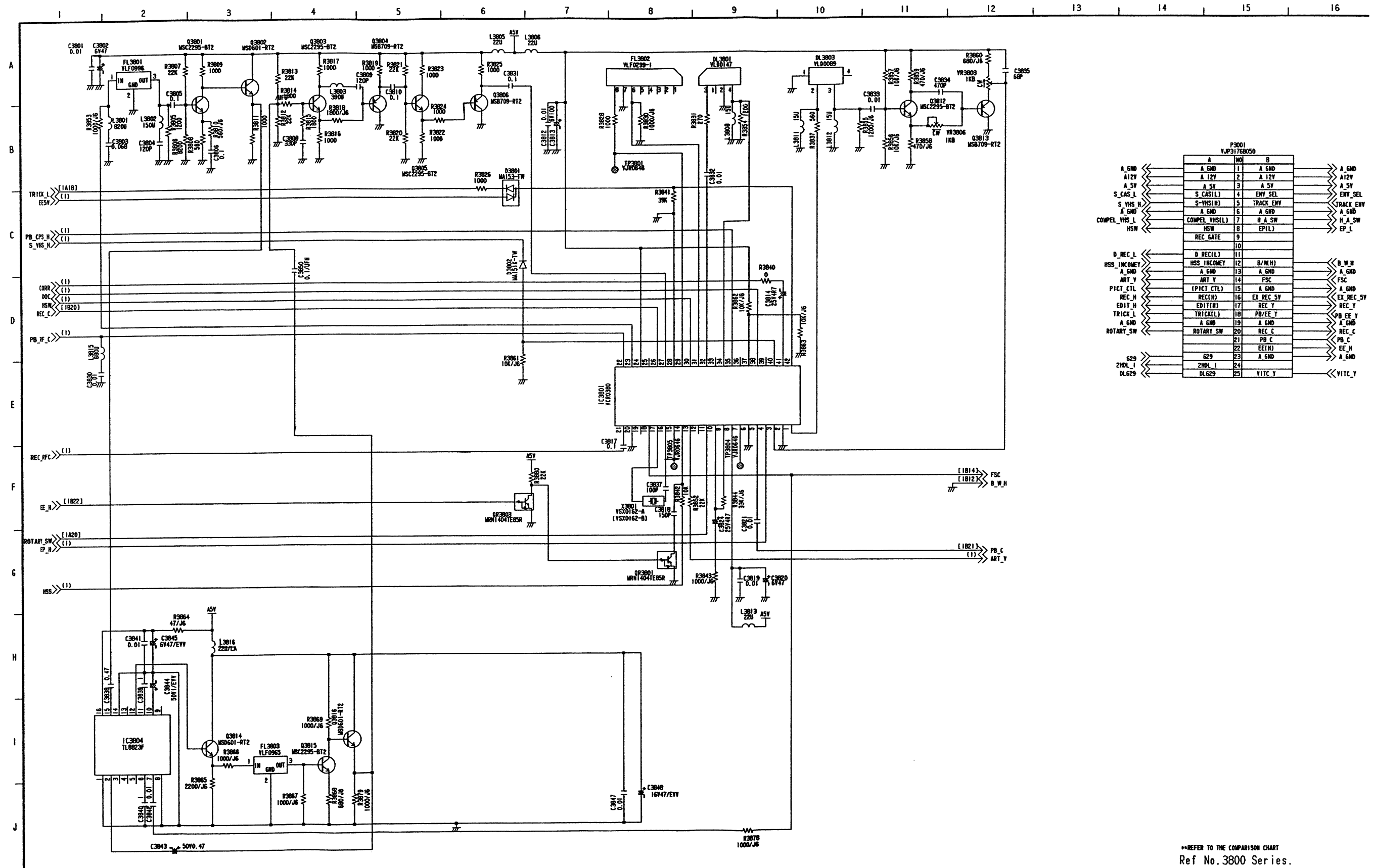
VIDEO 1 TRANSISTORS DC VOLTAGE

REF NO.	Q3001			Q3002			Q3003			Q3004			Q3005		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	2.5	7.6	3.2	0.1	0.1	0.8	0.1	0.2	0.8	0.5	4.2	1.2	0	0	0.4
REC	2.5	7.6	3.2	0.1	0.1	0.8	0.1	0.2	0.8	0	0.1	0	0	0	0.4
REF NO.	Q3006			Q3007			Q3008			Q3009			Q3010		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	0	0.4	1.4	3.8	2.1	0.8	4.7	1.4	0.7	4.7	1.3	1.4	2.9	2.1
REC	0	0	0.4	0	0.1	0	0	0.1	0	0	0.1	0	0	0.1	0
REF NO.	Q3011			Q3012			Q3013			Q3014			Q3015		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0.6	4.0	1.4	1.3	4.7	1.9	1.1	3.1	1.8	1.7	0	1.1	1.3	4.7	1.9
REC	0	0.1	0	0	0.1	0	0	0.1	0	0.1	0	0	0	0.1	0
REF NO.	Q3016			Q3017			Q3018			Q3022			Q3811		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0.5	3.3	1.3	2.7	4.7	3.3	4.8	4.9	5.5	3.5	4.7	4.2	0	4.9	0
REC	0	0.1	0	0	0.1	0.1	0.1	4.9	0	0	0.1	0.1	2.6	4.9	3.2
REF NO.	QR3002			QR3003			QR3004			QR3005			QR3006		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	2.9	0.1	0	1.0	0.1	0	0.2	0.2	4.9	4.8	0	0	0	4.8
REC	0	0.1	0.1	0	1.0	0.1	0	0.2	0.2	4.9	3.4	4.8	0	4.8	0
REF NO.	QR3007			QR3009			QR3010			QR3011			QR3012		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	0	4.0	0	5.5	0	0	0	5.0	4.9	0.5	4.9	0	4.9	0
REC	0	0	4.0	0	0	4.8	0	0	5.0	4.9	4.9	0	0	0	4.7
REF NO.	QR3013														
	E	C	B												
PLAY	0	0	4.8												
REC	0	3.2	0												

IC3003 (M52054FP)



VIDEO (1) SCHEMATIC DIAGRAM (E5: Page CBA-7) 2/2



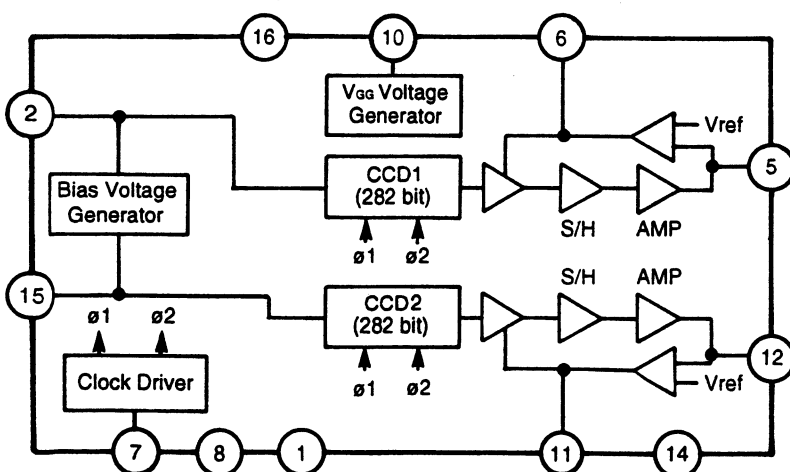
REFER TO THE COMPARISON CHART
Ref No.3800 Series.

VIDEO 1 ICs DC VOLTAGE CHART (Ref. No 3800 Series)

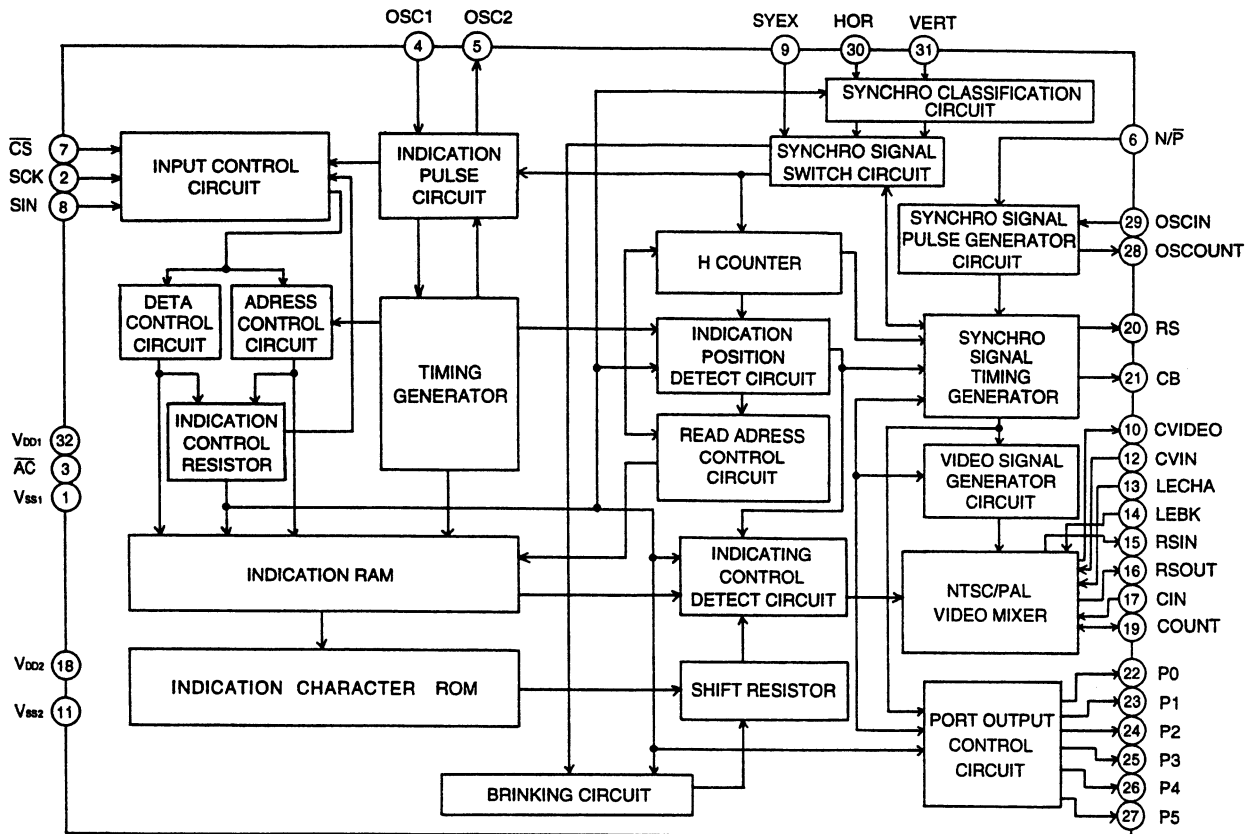
REF NO.	IC3801															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	3.0	0.5	0	2.0	0	2.3	4.8	3.0	3.0	3.4	0.3	0.8	1.2	3.5	3.8
REC	0	3.2	0.5	0	4.2	0	4.1	4.8	3.0	3.0	4.7	0.3	0.8	1.2	3.5	3.8
REF NO.	IC3801															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	0	1.7	0	0	2.5	2.1	0	4.6	0	1.8	2.1	0	2.1	4.7	0	0
REC	0	1.7	0	0	2.0	0	0	4.6	0	1.8	2.1	0	1.8	4.7	0	0
REF NO.	IC3801															
PIN NO.	33	34	35	36	37	38	39	40	41	42						
PLAY	3.1	0.5	2.4	2.9	3.2	4.8	2.4	1.3	2.4	2.0						
REC	3.4	0.5	4.1	3.2	2.8	1.2	3.9	1.3	3.9	4.3						

VIDEO 1 TRANSISTORS DC VOLTAGE CHART (Ref. No 3800 Series)

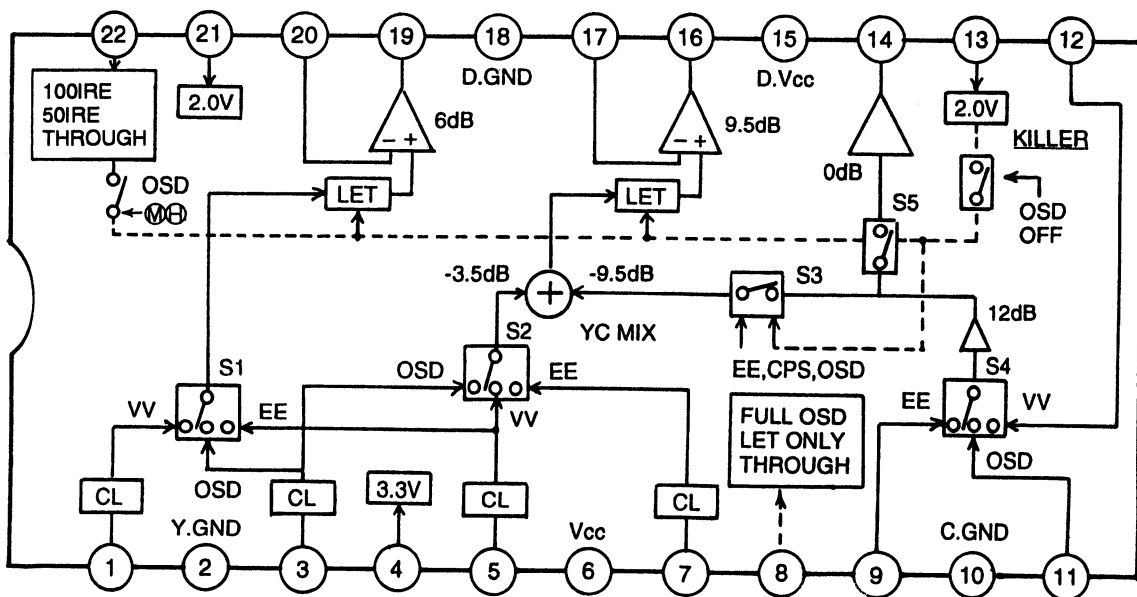
REF NO.	Q3801			Q3802			Q3803			Q3805			Q3806		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0.4	3.9	1.2	3.2	4.8	3.9	1.4	3.3	2.2	1.5	3.3	2.2	2.1	0	1.5
REC	0.4	3.9	1.2	3.2	4.8	3.9	1.4	3.3	2.2	1.5	3.3	2.2	2.1	0	1.5
REF NO.	Q3807			Q3808			Q3809			QR3801			QR3802		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0.5	0	0	0.5	0	0	0.5	0	0	0	0	4.8	0	0	4.7
REC	0.5	0	0	0.5	0	0	0.5	0	0	0	0.5	0.1	0	0	4.7

IC3804 (TL8823F)

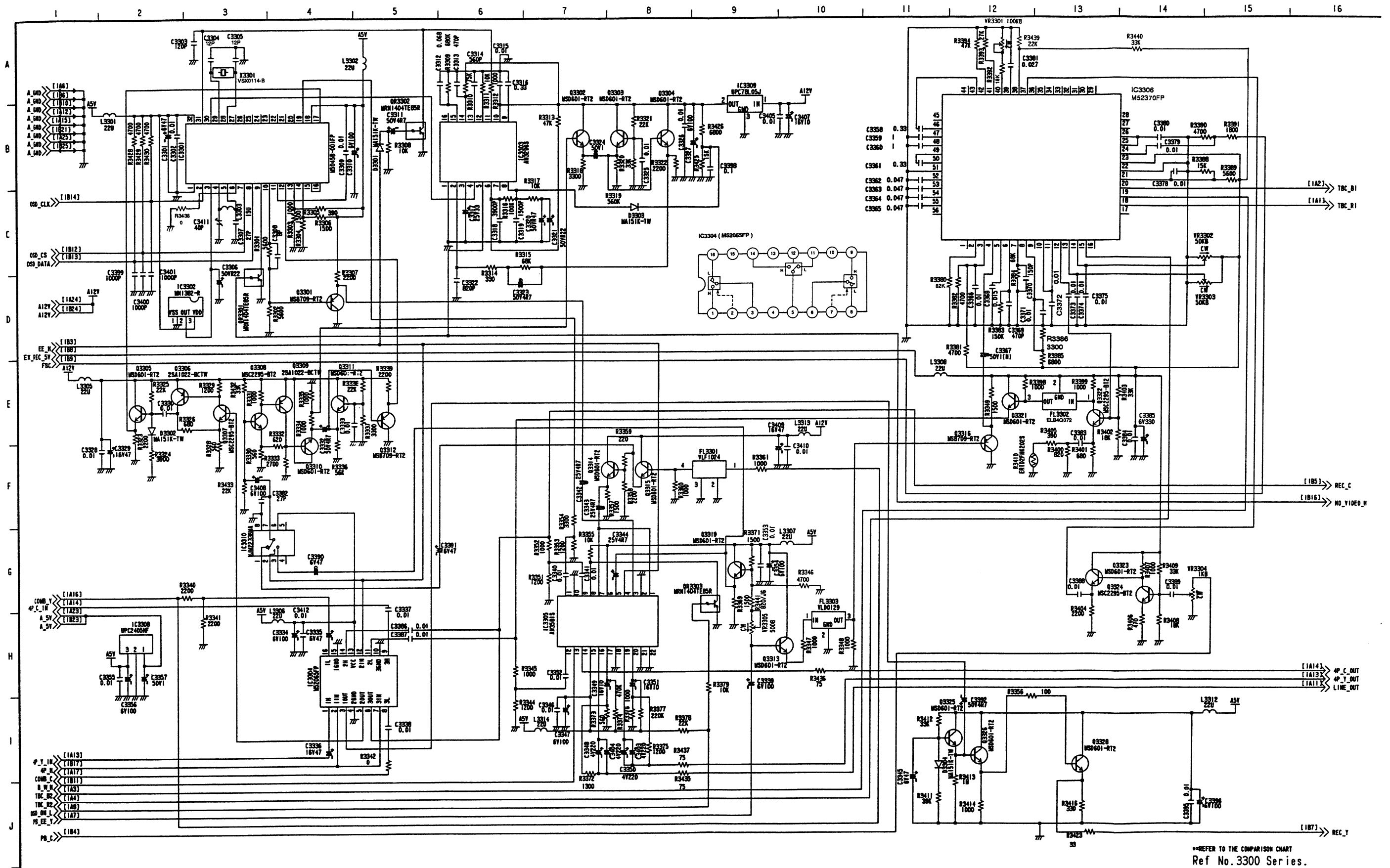
IC3301 (M50458-001FP)



IC3305 (AN3581N)



VIDEO (2) SCHEMATIC DIAGRAM (E6:Page CBA-8)



*REFER TO THE COMPARISON CHART
Ref No. 3300 Series.

[illegible]

>> TBC_B1
>> TBC_R1

> REC_C
> NO_VIDEO_H

>> AP_C_OUT
>> AP_Y_OUT
>> LINE_OUT

> REC_Y

VIDEO 2 ICs DC VOLTAGE CHART

REF NO.	IC3301															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	4.7	0	2.2	2.1	4.8	0	0.1	4.8	2.6	0	0	0	2.3	1.9	1.9
REC	0	4.7	0	2.2	2.1	4.8	4.1	0.1	4.8	2.6	0	2.6	3.4	2.3	1.9	1.9
REF NO.	IC3301															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	0	0	1.7	0.3	0.3	0	0	0	0	0	0	2.2	2.2	3.4	4.8	4.9
REC	1.8	4.9	1.7	0.7	0.7	0	0	0	0	0	0	2.2	2.2	3.4	4.8	4.9
REF NO.	IC3302															
PIN NO.	1	2	3													
PLAY	0	4.9	4.9													
REC	0	4.9	4.9													
REF NO.	IC3303															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	3.3	4.1	3.4	0.1	2.9	0	2.9	2.2	5.0	4.8	0.6	0	1.3	3.7	4.1
REC	0	3.3	4.1	3.4	0.1	2.9	0	2.9	2.2	5.0	4.8	0.6	0	1.3	3.7	4.1
REF NO.	IC3304															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	1.9	0	1.9	0	1.9	1.8	0	1.9	1.9	0	1.9	0	4.9	1.9	0	1.9
REC	1.9	0	1.9	0	1.9	1.8	0	1.9	1.9	0	1.9	4.7	4.9	1.9	0	1.9
REF NO.	IC3305															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	2.3	0	2.4	0	2.3	4.8	2.3	0	1.9	0	1.9	1.9	0.3	2.3	4.9	2.2
REC	2.3	0	2.4	4.7	2.3	4.8	2.3	0	1.9	0	1.9	1.9	0.3	2.3	4.9	2.2
REF NO.	IC3305															
PIN NO.	17	18	19	20	21	22										
PLAY	1.5	0	2.0	1.6	0	0										
REC	1.5	0	2.0	1.6	0	0										
REF NO.	IC3306															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	2.4	2.3	2.6	2.0	2.5	2.8	0	1.7	2.0	2.0	1.5	1.0	1.2	2.6	0
REC	0	0	0	0.3	0.1	0	0	0	0.1	0	0	0	0	0	0.1	0
REF NO.	IC3306															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	0	1.7	2.7	1.8	3.3	0	4.6	2.6	2.3	2.2	0	0	0	0	0	0
REC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REF NO.	IC3306															
PIN NO.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
PLAY	0	0	0	0	2.7	0	2.6	2.4	2.4	2.5	2.0	0	0	3.3	1.9	1.9
REC	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0
REF NO.	IC3306															
PIN NO.	49	50	51	52	53	54	55	56								
PLAY	2.0	3.3	0	2.9	2.9	0	2.9	0								
REC	0	0	0	0	0	0	0	0								
REF NO.	IC3308				IC3309				IC3310							
PIN NO.	1	2	3		1	2	3		1	2	3	4	5	6	7	8
PLAY	5.7	0	4.9		11.9	5.0	0		2.9	0	2.9	0	0	4.9	2.1	0
REC	5.7	0	4.9		11.9	5.0	0		2.9	4.7	2.9	0	0	4.9	2.1	0

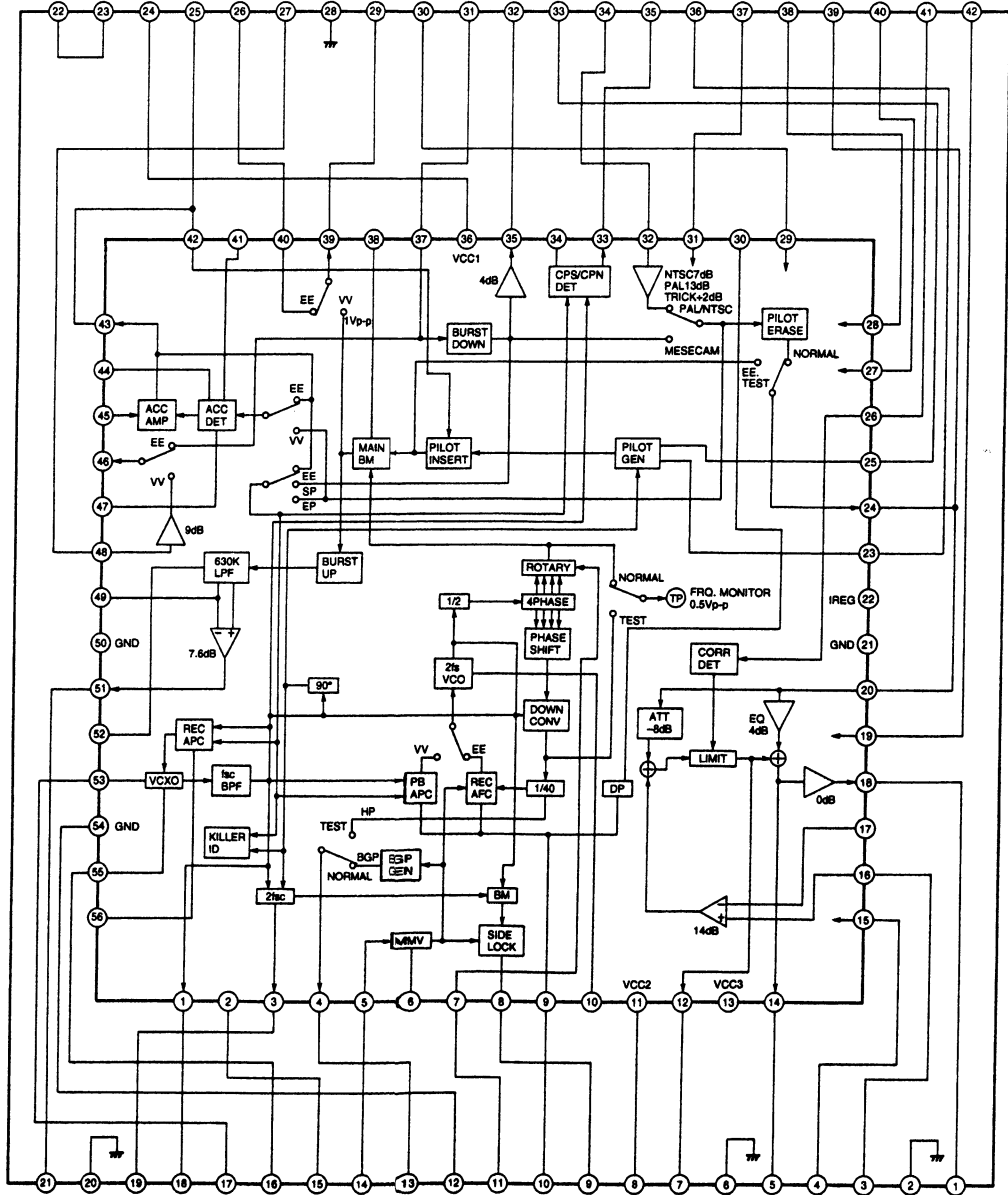
VIDEO 2 TRANSTORs DC VOLTAGE CHART

REF NO.	Q3301			Q3302			Q3303			Q3304			Q3305		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	1.9	0	1.3	2.9	5.0	3.5	2.9	5.0	3.0	2.3	5.0	2.9	1.7	11.8	2.2
REC	1.9	0	1.3	2.9	5.0	3.5	2.9	5.0	3.0	2.3	5.0	2.9	1.7	11.8	2.2
REF NO.	Q3306			Q3307			Q3308			Q3309			Q3310		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	11.8	2.4	11.1	1.2	11.1	1.9	3.8	11.1	4.5	11.8	7.7	11.1	7.0	11.8	7.7
REC	11.8	2.4	11.1	1.2	11.1	1.9	3.8	11.1	4.5	11.8	7.7	11.1	7.0	11.8	7.7

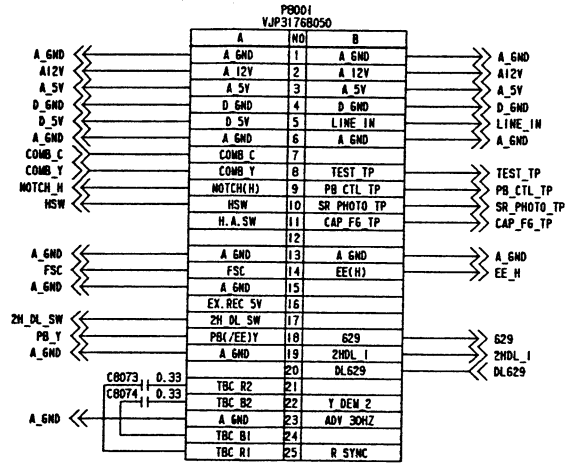
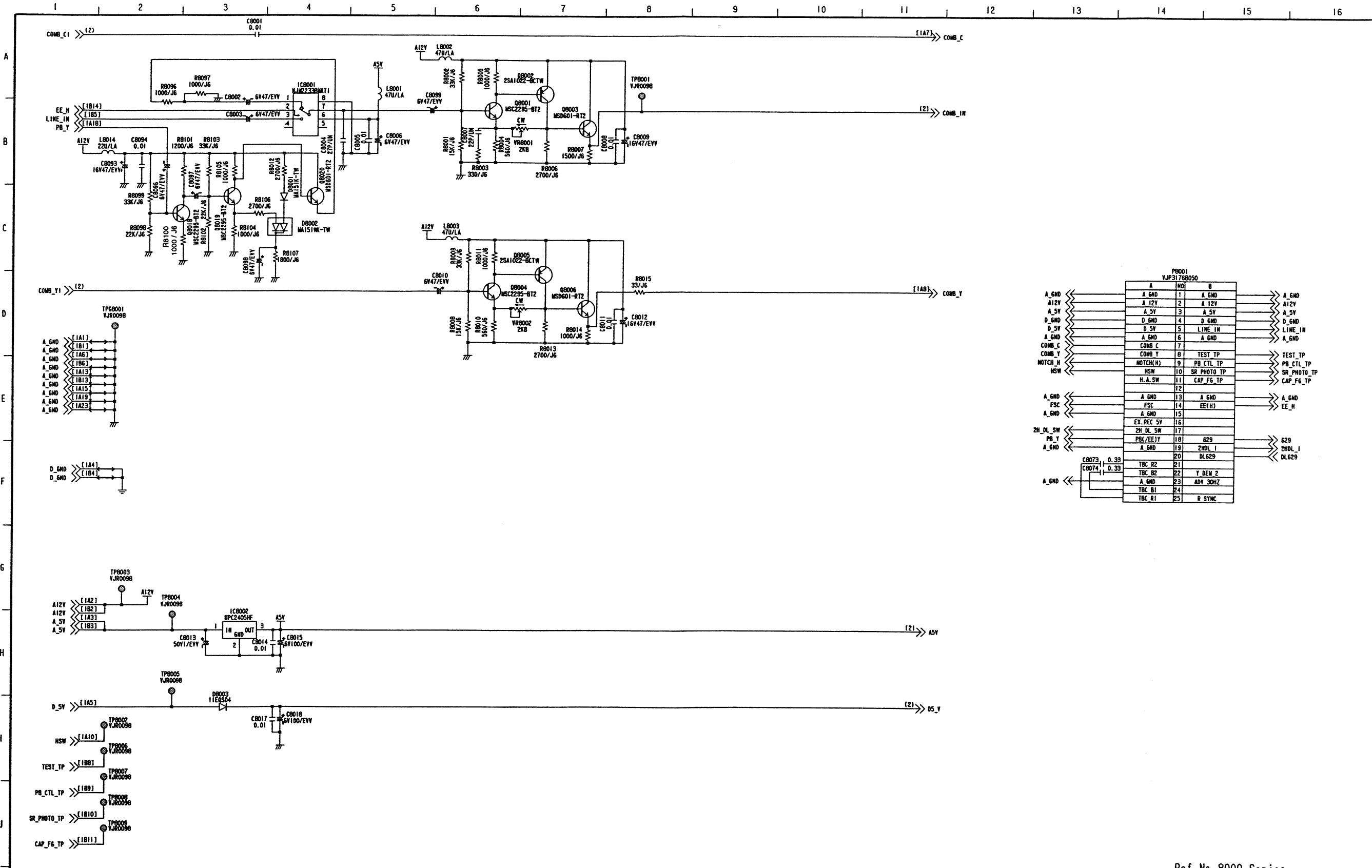
VIDEO 2 TRANSISTORS DC VOLTAGE CHART

REF NO.	Q3311			Q3312			Q3313			Q3314			Q3315		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	1.9	11.8	1.5	2.6	0	1.9	3.0	4.8	3.6	1.5	11.9	2.1	2.3	11.9	2.9
REC	1.9	11.8	1.5	2.6	0	1.9	3.0	4.8	3.6	1.5	11.9	2.1	2.3	11.9	2.9
REF NO.	Q3316			Q3319			Q3321			Q3322			Q3323		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	2.1	0	1.5	3.0	4.8	3.7	4.0	4.6	4.6	0.7	3.5	1.4	2.5	4.6	3.0
REC	0.1	0	1.5	3.0	4.8	3.7	0	0.1	0.1	0	0.1	0	0	0.1	0.1
REF NO.	Q3324			Q3325			Q3326			Q3328					
	E	C	B	E	C	B	E	C	B	E	C	B			
PLAY	0.6	3.0	1.4	2.7	4.9	2.8	2.1	4.9	2.7	1.4	4.9	2.1			
REC	0	0.1	0	2.7	4.9	2.8	2.1	4.9	2.7	1.4	4.9	2.1			
REF NO.	QR3301			QR3302			QR3303								
	E	C	B	E	C	B	E	C	B						
PLAY	0	4.8	0.1	0	4.8	0	0	0	2.9						
REC	0	4.8	0.1	0	4.8	0	0	0	2.9						

IC3306 (M52370FP)



VIDEO (3) SCHEMATIC DIAGRAM (E7: Page CBA-9) 1/2



VIDEO 3

REF NO.
PIN NO.
PLAY
REC

VIDEO 3

REF NO.
PLAY
REC
REF NO.
PLAY
REC

Ref No.8000 Series.

VIDEO 3 ICs DC VOLTAGE (Ref No. 8000 Series)

REF NO.	IC8001								IC8002							
PIN NO.	1	2	3	4	5	6	7	8	1	2	3					
PLAY	2.9	0	2.9	0	0	4.9	2.2	0	5.7	0	4.9					
REC	2.9	4.7	2.9	0	0	4.9	2.2	0	5.7	0	4.9					

VIDEO 3 TRANSISTORs DC VOLTAGE (Ref No. 8000 Series)

REF NO.	Q8001			Q8002			Q8003			Q8004			Q8005		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	2.9	11.1	3.6	11.8	6.7	11.1	6.1	11.8	6.7	2.9	11.1	3.6	11.8	6.8	11.1
REC	2.9	11.1	3.6	11.8	6.7	11.1	6.1	11.8	6.7	2.9	11.1	3.6	11.8	6.8	11.1
REF NO.	Q8006			Q8018			Q8019			Q8020					
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	6.1	11.8	6.8	3.5	7.6	4.2	3.5	8.3	4.2	7.7	11.9	8.3			
REC	6.1	11.8	6.8	3.5	7.6	4.2	3.5	8.3	4.2	7.7	11.9	8.3			

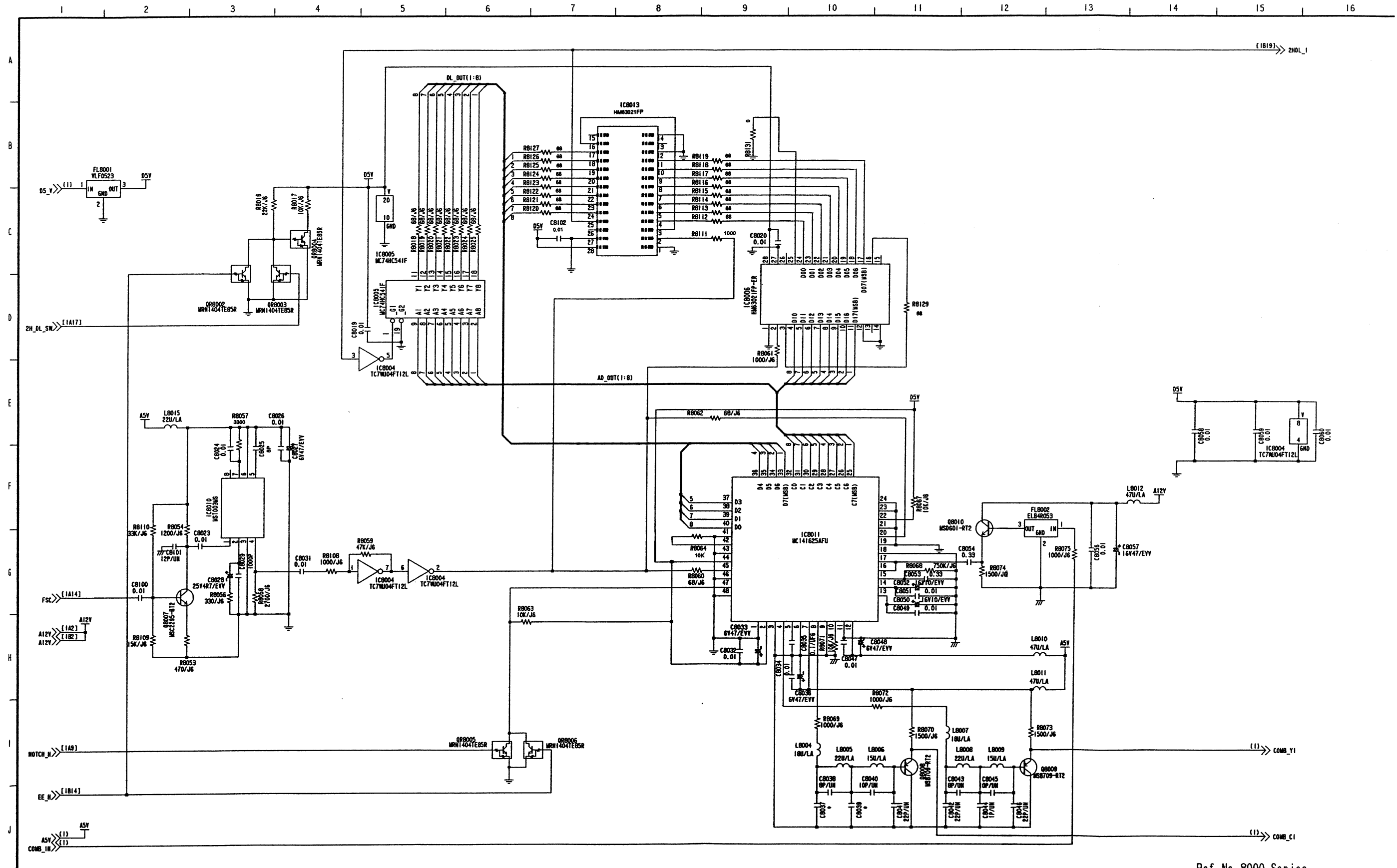
VIDEO 3 ICs DC VOLTAGE (Ref No. 8000 Series)

REF NO.	IC8004															
PIN NO.	1	2	3	4	5	6	7	8								
PLAY	2.4	2.3	3.3	0	0.1	2.4	2.4	4.8								
REC	2.4	2.3	3.3	0	0.1	2.4	2.4	4.8								
REF NO.	IC8005															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0.1	1.5	2.2	2.1	2.2	2.6	2.2	2.2	2.3	0	2.4	2.2	2.4	2.5	2.0	2.1
REC	0.1	1.8	2.6	1.9	2.0	2.8	2.2	1.7	2.6	0	2.4	2.3	2.4	2.7	2.1	1.8
REF NO.	IC8005															
PIN NO.	17	18	19	20												
PLAY	2.2	1.5	0	4.8												
REC	2.7	1.8	0	4.8												
REF NO.	IC8006															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	2.3	4.8	2.3	0	2.2	2.5	2.3	2.0	2.2	1.5	0	4.3	0	4.5	4.5
REC	0	2.3	4.8	2.6	1.7	0	2.7	2.0	1.8	2.6	1.8	0	4.3	0	4.5	4.5
REF NO.	IC8006															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28				
PLAY	1.5	2.2	2.1	2.3	2.6	2.3	2.3	2.3	3.3	4.4	0	4.8				
REC	1.8	2.7	1.7	1.7	2.1	2.3	1.8	0	3.3	4.3	0	4.8				
REF NO.	IC8008															
PIN NO.	1	2	3	4	5											
PLAY	2.4	4.5	0	4.8	4.8											
REC	2.4	4.3	0	4.8	4.8											
REF NO.	IC8010															
PIN NO.	1	2	3	4	5	6	7	8								
PLAY	2.5	2.0	0	2.6	3.1	4.8	0	0								
REC	2.5	2.0	0	2.6	3.1	4.8	5.4	0								
REF NO.	IC8011															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	4.9	0	0.8	1.4	0	4.8	0.7	0	1.1	0	4.8	4.4	0	2.9	0
REC	0	4.8	0	0	1.4	0	0	0.8	0	1.1	0	4.8	4.4	1.4	2.8	2.9
REF NO.	IC8011															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	2.6	0	0	2.3	0	0	0	0	1.5	2.2	2.1	2.2	2.7	2.2	2.2	2.2
REC	2.9	0	0	2.3	0	4.8	0	0	1.8	2.6	1.7	2.0	2.7	2.2	1.7	0
REF NO.	IC8011															
PIN NO.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
PLAY	1.5	2.3	2.1	2.2	2.7	2.2	2.3	2.3	0	4.8	0	4.8	2.3	0	4.8	0
REC	1.9	0	1.6	2.0	2.8	2.2	1.8	2.7	0	4.8	0	4.8	2.3	0	0	0

VIDEO 3 TRANSISTORs DC VOLTAGE (Ref No. 8000 Series)

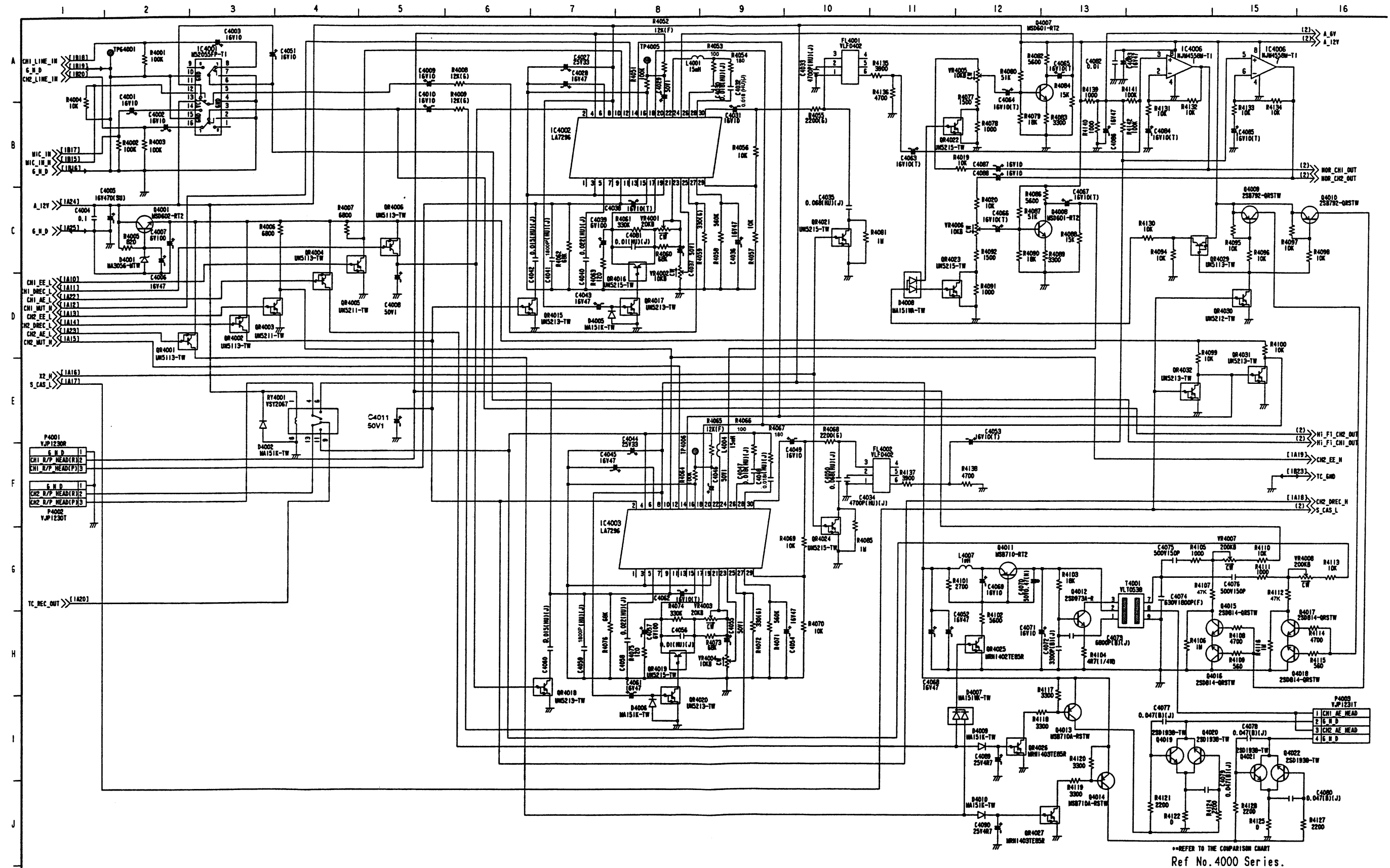
REF NO.	Q8007			Q8008			Q8009			Q8010					
	E	C	B	E	C	B	E	C	B	E	C	B			
PLAY	1.0	2.2	1.8	1.4	0	0.7	1.4	0	0.8	5.5	11.9	0.1			
REC	1.0	2.2	1.8	1.4	0	0.7	1.4	0	0.8	5.5	11.9	0.1			
REF NO.	QR8002			QR8003			QR8004			QR8005			QR8006		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	0	0	0	0	4.8	0	3.3	0	0	4.8	0	0	4.8	0
REC	0	0	4.7	0	0	4.8	0	3.3	0	0	0	0	0	0	4.7

VIDEO (3) SCHEMATIC DIAGRAM (E7:Page CBA-9) 2/2



Ref No. 8000 Series.

AUDIO 1 SCHEMATIC DIAGRAM (E8: Page CBA-6)



FM AUDIO PACK SCHEMATIC DIAGRAM (E8-1: Page CBA-10)

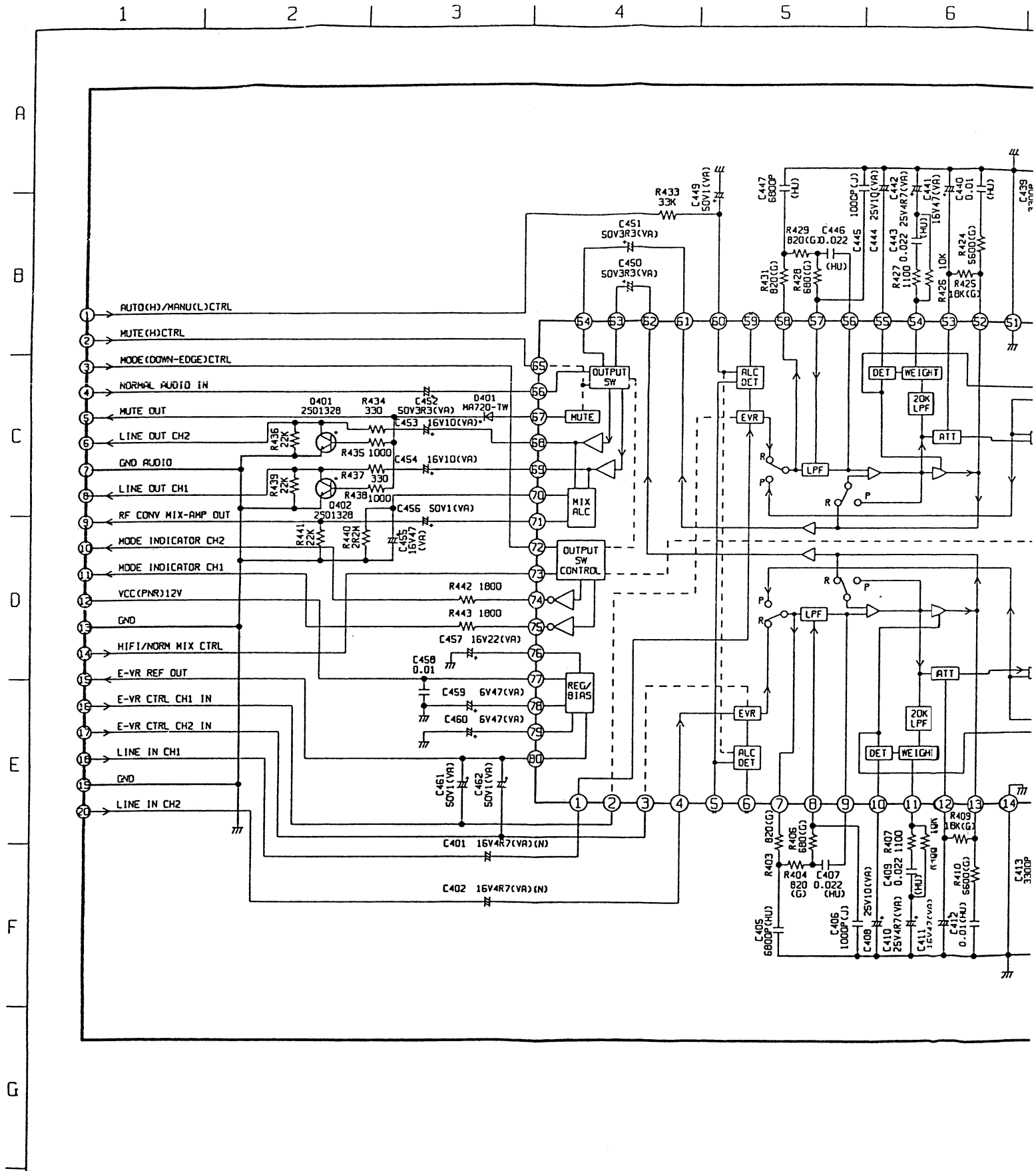
IC4505 (VEP04353B)

AUDIO 1 ICs DC VOLTAGE CHART

REF NO.	IC4001															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	5.8	0	4.4	0	4.4	4.4	0	5.8	5.8	0	5.8	0	11.9	5.8	0	5.8
REC	5.8	0	4.4	0	4.4	4.4	0	5.8	5.8	0	5.8	0	11.9	5.8	0	5.8
REF NO.	IC4002															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0.1	0	0	0	7.9	9.0	0	11.9	0	0	0	0	0	0	2.1	0
REC	1.4	4.9	0	0	7.9	9.0	0	11.9	0	4.7	0	0	0	0	2.1	0
REF NO.	IC4002															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
PLAY	2.2	4.0	0	3.8	2.2	1.2	0	0	0	0	0.2	0	0	4.0		
REC	2.2	4.0	0	3.8	2.2	1.2	0	0	0	0	0	0	0	4.0		
REF NO.	IC4003															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0.2	0	0	0	7.9	8.9	0	11.9	0	0	0	0	0	0	2.1	0
REC	11.4	14.9	0	0	7.9	8.9	0	11.9	0	4.7	0	0	0	0	2.1	0
REF NO.	IC4003															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
PLAY	2.2	4.0	0	3.8	2.2	1.2	0	0	0	0	0.2	0	0	4.2		
REC	2.2	4.0	0	3.8	2.2	1.2	0	0	0	0	0	0	0	4.2		

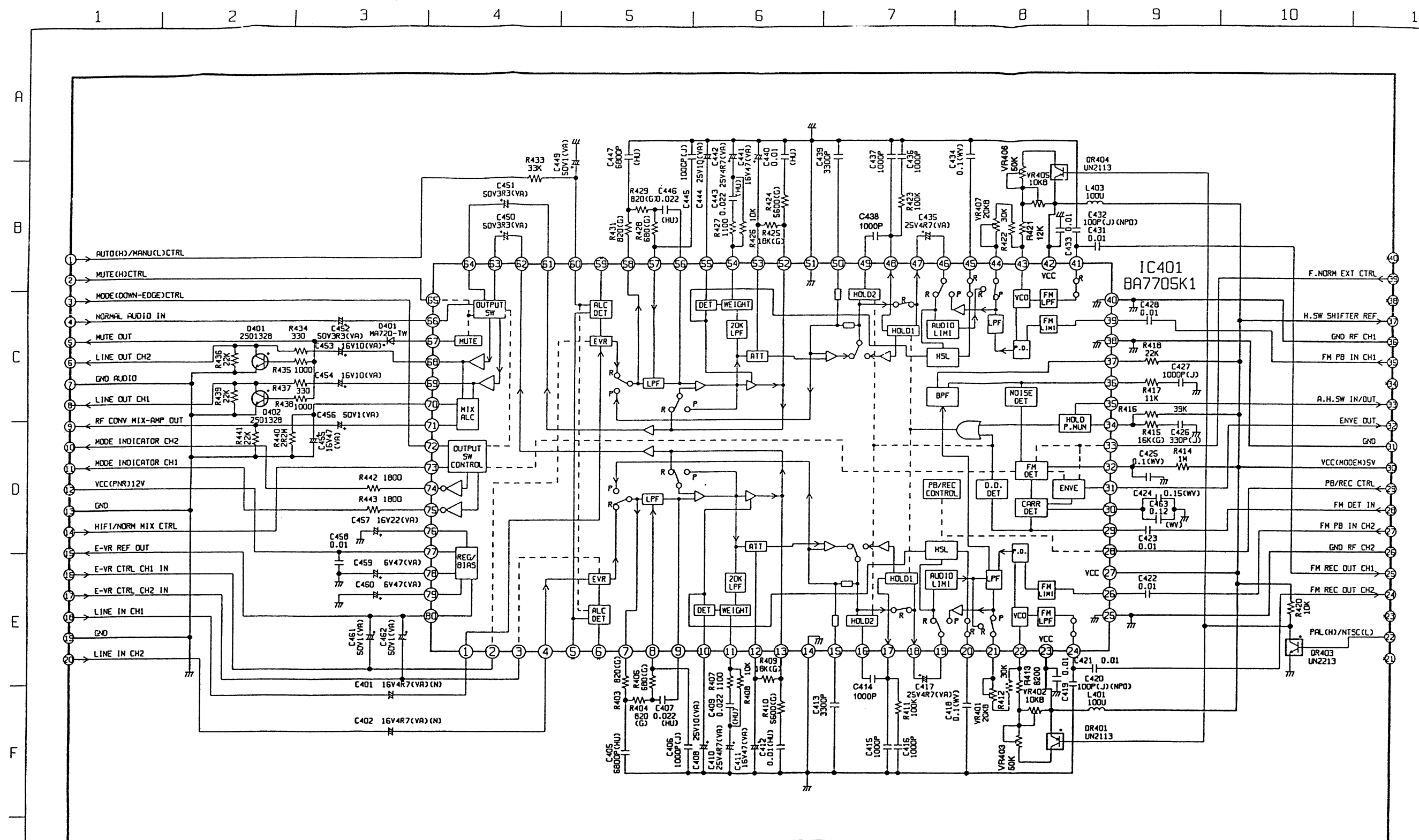
AUDIO 1 TRANSISTORS DC VOLTAGE CHART

REF NO.	Q4001			Q4007			Q4009			Q4010			Q4011		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	5.0	11.9	5.6	2.4	7.7	3.0	11.9	11.6	11.1	11.9	11.6	11.1	11.9	0.1	11.9
REC	5.0	11.9	5.6	2.4	7.7	3.0	11.9	11.6	11.1	11.9	11.6	11.1	11.6	0	10.9
REF NO.	Q4013			Q4014			Q4015			Q4016			Q4017		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	11.9	0	11.9	11.9	0	11.9	0	0	0.6	0	0	0.7	0	0	0.6
REC	11.9	11.8	11.2	11.9	11.8	11.2	0	0	0.6	0	0	0.7	0	0	0.6
REF NO.	Q4018			Q4019			Q4020			Q4021			Q4022		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0
REC	0	0	0.7	0	0	0.7	0	0	0.7	0	0	0.6	0	0	0.6
REF NO.	QR4001			QR4002			QR4003			QR4004			QR4005		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	5.0	0	4.9	5.0	0	4.9	0	0	4.8	5.0	0	4.9	0	0	4.8
REC	5.0	5.0	0	5.0	5.0	0	0	4.7	0	5.0	5.0	0	0	4.7	0
REF NO.	QR4006			QR4015			QR4016			QR4017			QR4018		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	5.0	0	4.9	0	0	0	2.2	2.2	0.1	0	0.1	0	0	0	0
REC	5.0	5.0	0	0	0	4.9	2.2	2.2	0	0	0	0	0	0	5.0
REF NO.	QR4019			QR4020			QR4021			QR4024			QR4025		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	2.2	0	0.1	0	0.1	0	0	0	0	0	0	0	0	11.9	0
REC	2.2	2.2	0	0	0	0	0	0	0	0	0	0	0	0	4.5
REF NO.	QR4026			QR4027			QR4028			QR4029			QR4030		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	0	11.9	0	0	11.9	0	11.9	0	11.8	11.9	11.8	0	0	0	5.0
REC	0	0	4.5	0	0	4.5	11.9	0	11.8	11.9	11.8	0	0	0	5.0
REF NO.	QR4031			QR4032											
	E	C	B	E	C	B									
PLAY	0	4.0	0	0	0	5.0									
REC	0	4.0	0	0	0	5.0									

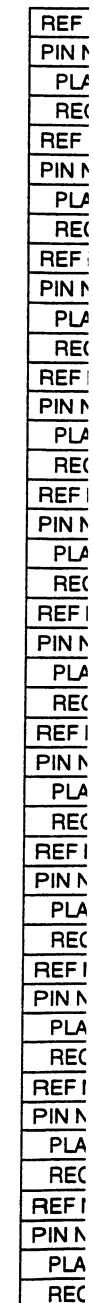


FM AUDIO PACK SCHEMATIC DIAGRAM (E8-1: Page CBA-10)

IC4505 (VEP04353B)



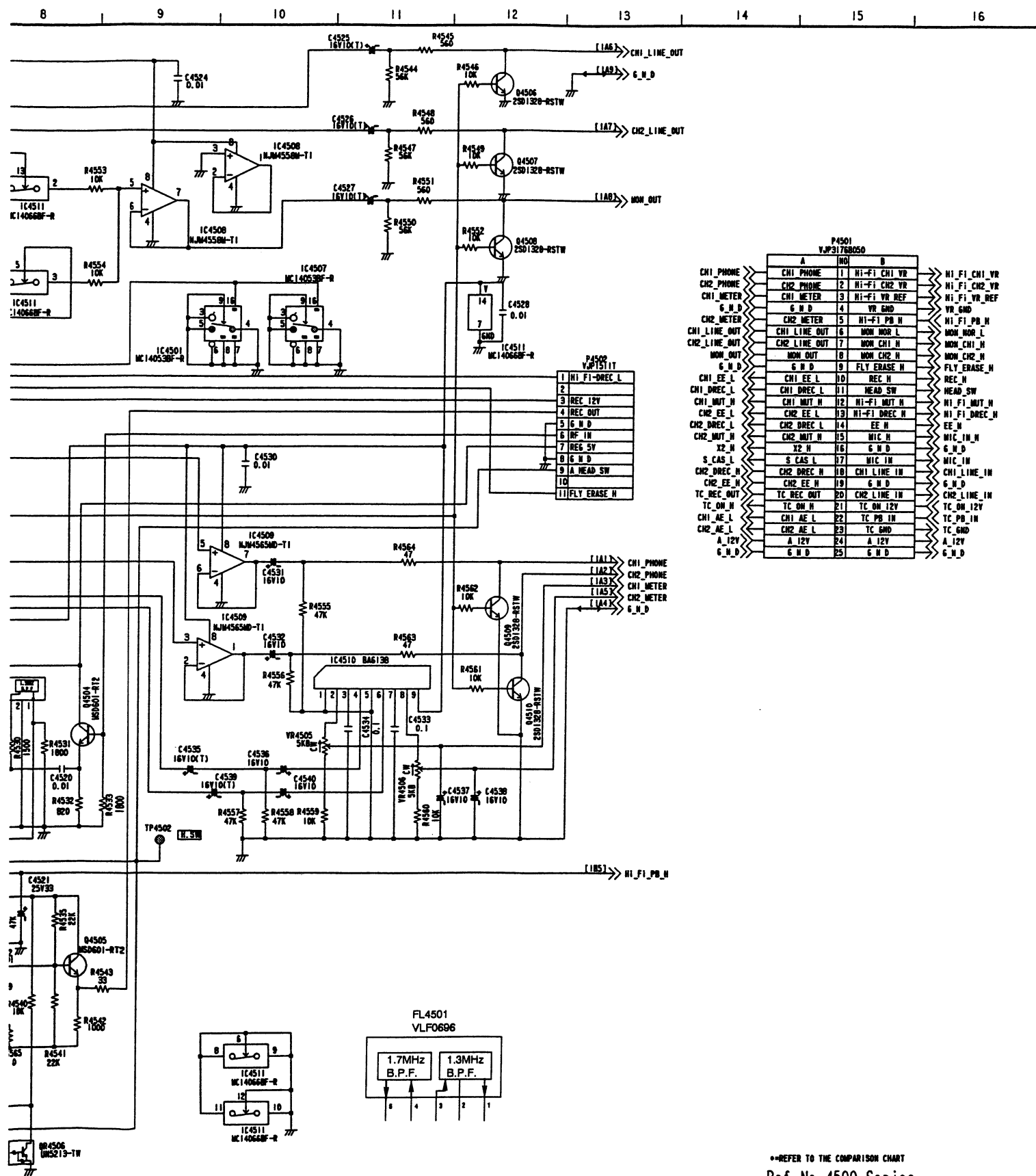
AUC



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REC



••REFER TO THE COMPARISON CHART
Ref No.4500 Series.

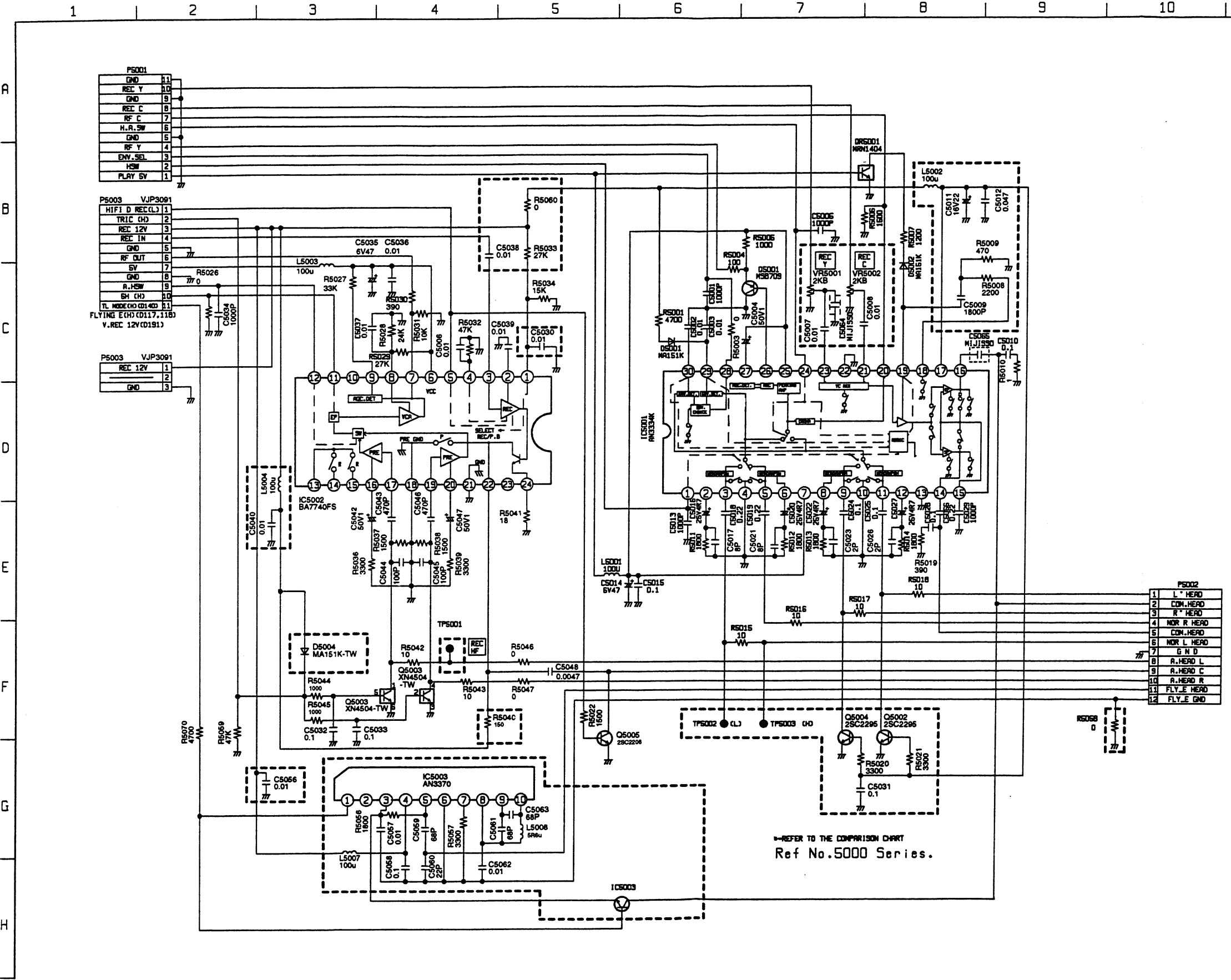
AUDIO 2 ICs DC VOLTAGE

REF NO.	IC4501															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	5.8	5.9	0	0	0	0	0	0	0	0	0	5.9	5.9	5.9	5.9	11.9
REC	5.8	5.9	0	0	0	0	0	0	0	0	0	5.9	5.9	5.9	5.9	11.9
REF NO.	IC4502															
PIN NO.	1	2	3	4	5	6	7	8								
PLAY	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9								
REC	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9								
REF NO.	IC4503															
PIN NO.	1	2	3	4	5	6	7	8	1	2	3					
PLAY	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9	11.9	0	4.9					
REC	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9	11.9	0	4.9					
REF NO.	IC4505															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	0	0	5.3	5.3	1.2	0	0	0	0	1.7	1.7	11.9	0	0	4.8	4.8
REC	0	0	5.3	0	0.2	0	0	0	0	1.7	1.7	11.9	0	0	4.8	4.4
REF NO.	IC4505															
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
PLAY	4.5	1.8	0	1.8	0	0	0	0	0	0	0	0	0	4.9	0	3.5
REC	4.5	1.8	0	1.8	0	0	0	0	0	0	0	0	0	4.7	4.9	0
REF NO.	IC4505															
PIN NO.	33	34	35	36	37	38	39	40								
PLAY	0	0	0	0	4.9	0	0	0								
REC	4.9	0	0	0	4.9	0	0	0								
REF NO.	IC4506															
PIN NO.	1	2	3	4	5	6	7									
PLAY	0	4.9	4.9	0	0.7	4.8	0									
REC	0	4.9	4.9	0	0.7	4.8	0									
REF NO.	IC4507															
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PLAY	5.9	5.9	0	0	0	0	0	0	0	11.9	11.9	5.9	5.9	5.9	5.9	11.9
REC	5.9	5.9	0	0	0	0	0	0	0	11.9	11.9	5.9	5.9	5.9	5.9	11.9
REF NO.	IC4508															
PIN NO.	1	2	3	4	5	6	7	8								
PLAY	11.4	11.4	0	0	5.9	5.9	5.9	11.9								
REC	11.4	11.4	0	0	5.9	5.9	5.9	11.9								
REF NO.	IC4509															
PIN NO.	1	2	3	4	5	6	7	8								
PLAY	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9								
REC	5.9	5.9	5.9	0	5.9	5.9	5.9	11.9								
REF NO.	IC4510															
PIN NO.	1	2	3	4	5	6	7	8	9							
PLAY	0	1.6	2.2	1.9	0	1.9	2.3	1.7	11.9							
REC	0	0	0.6	1.9	0	1.9	0.6	0	11.9							

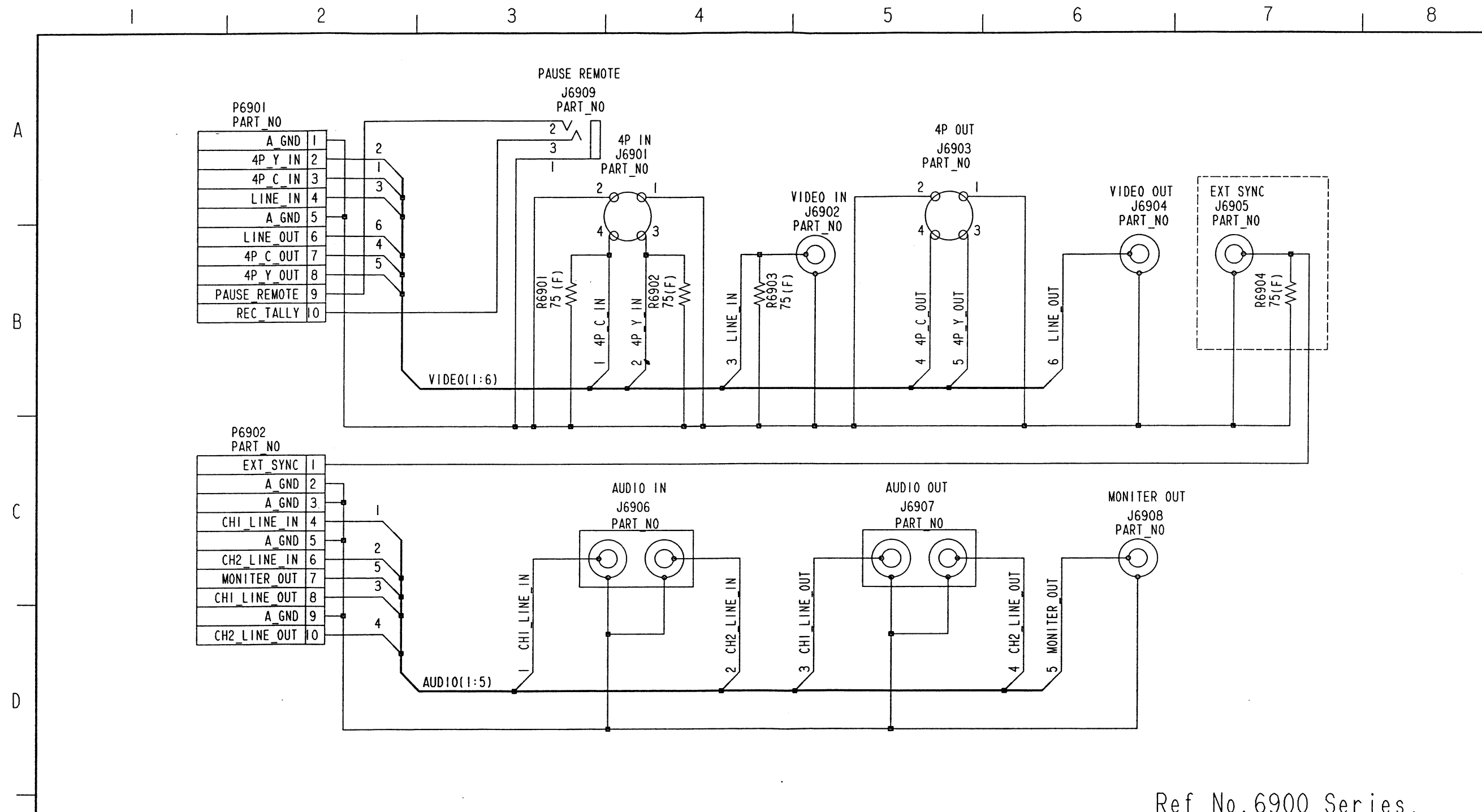
AUDIO 2 TRANSISTORS DC VOLTAGE

REF NO.	Q4501			Q4502			Q4503			Q4504			Q4505		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
PLAY	11.9	0	11.8	11.5	0.2	11.7	4.8	11.9	5.4	1.3	4.9	1.9	1.8	4.9	2.4
REC	11.9	11.7	11.1	11.3	0	11.7	4.8	11.9	5.4	2.4	4.9	3.0	1.8	4.9	2.4
REF NO.	Q4507			Q4508			Q4509			Q4510					
	E	C	B	E	C	B	E	C	B	E	C	B			
PLAY	0	0	0.3	0	0	0.3	0	0	0.2	0	0	0.2			
REC	0	0	0	0	0	0	0	0	0	0	0	0			
REF NO.	QR4502			QR4503			QR4504								
	E	C	B	E	C	B	1	2	3	4	5				
PLAY	0	11.8	0	0	3.6	0	11.9	5.4	4.8	4.2	4.8				
REC	0	0	4.8	0	3.6	0	11.9	5.4	4.8	4.2	4.8				
REF NO.	QR4505			QR4506											
	E	C	B	E	C	B									
PLAY	0	0	0	0	0	5.0									
REC	0	0	0	0	0	5.0									

HEAD AMP SCHEMATIC DIAGRAM (E12: Page CBA-10)

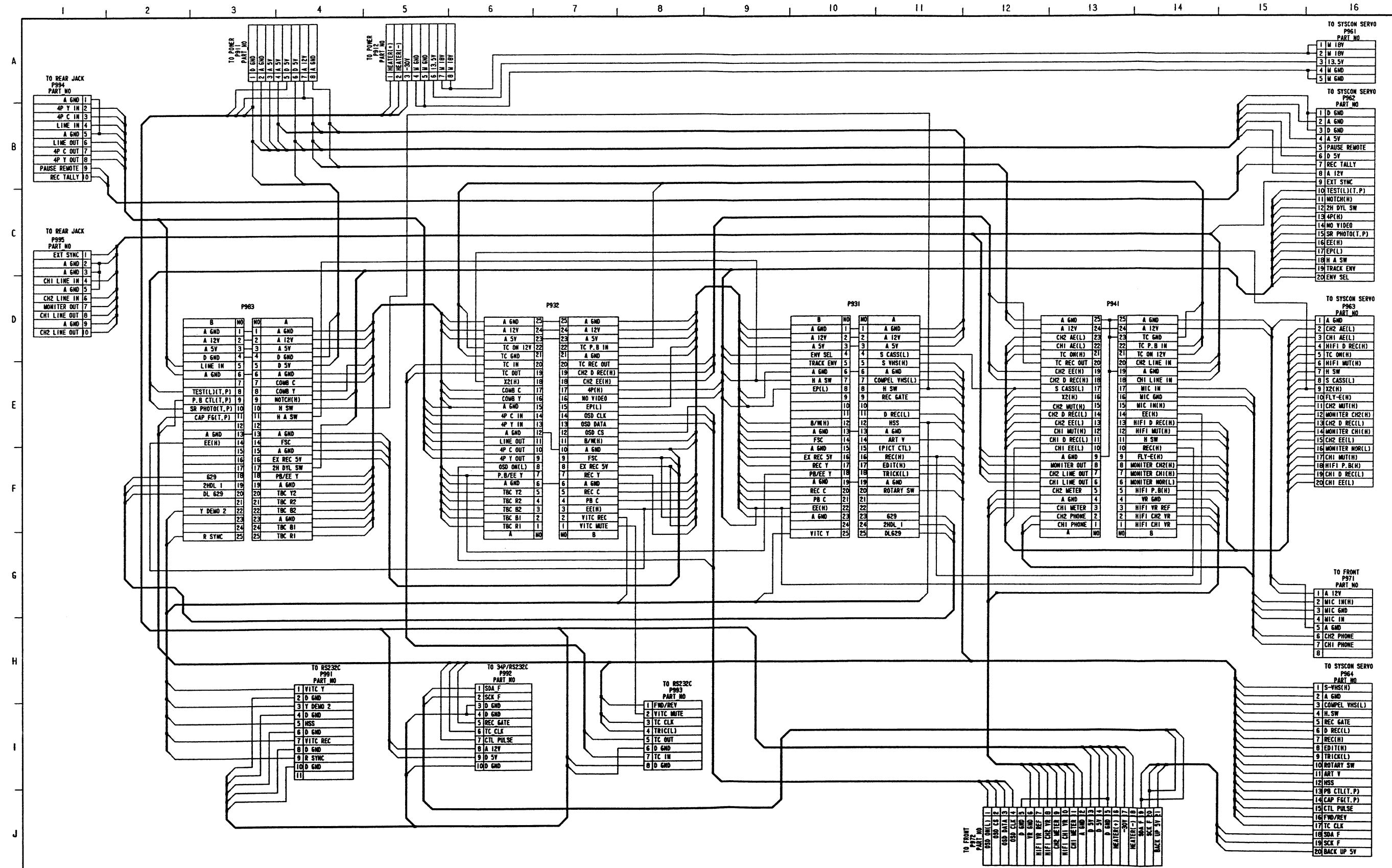


REAR JACK SCHEMATIC DIAGRAM (E13: Page CBA-12)

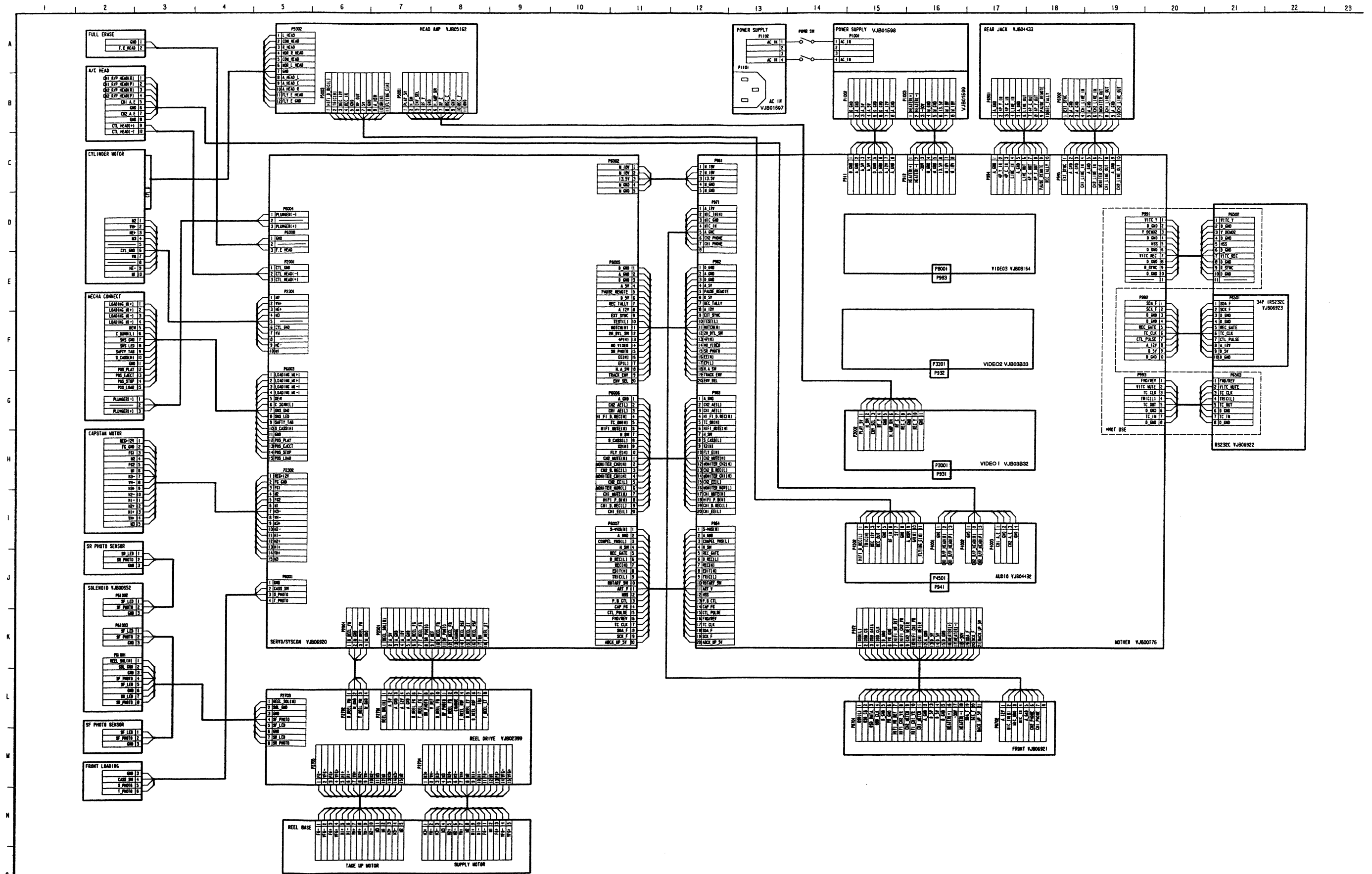


Ref No.6900 Series.

MOTHER SCHEMATIC DIAGRAM (E9: Page CBA-11)



INTERCONNECTION SCHEMATIC DIAGRAM



SECTION 7

CIRCUIT BOARDS

CONTENTS

POWER SUPPLY (1~3) C.B.A.	CBA-3
REEL DRIVE C.B.A.	CBA-3
FRONT (1~4) C.B.A.	CBA-4
SYSTEM CONTROL & SERVO C.B.A.	CBA-5
AUDIO C.B.A.	CBA-6
VIDEO (1) C.B.A.	CBA-7
VIDEO (2) C.B.A.	CBA-8
VIDEO (3) C.B.A.	CBA-9
FM AUDIO PACK C.B.A.	CBA-10
HEAD AMP C.B.A.	CBA-10
MOTHER C.B.A.	CBA-11
REAR JACK C.B.A.	CBA-12

IMPORTANT SAFETY NOTICE

COMPONENTS IDENTIFIED WITH THE MARK \triangle HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.

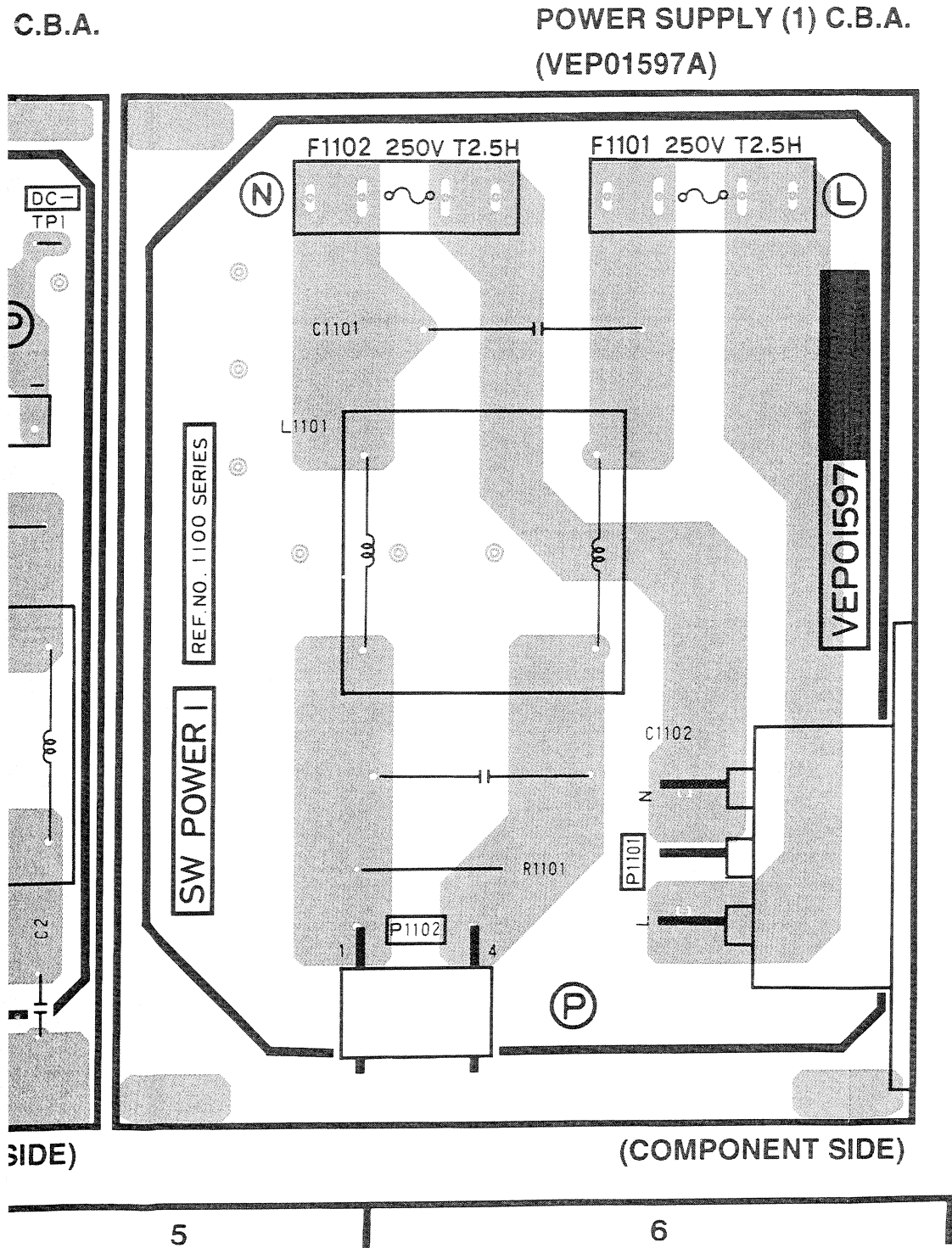
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

NOTE

DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST. AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

SUPPLY (3) C.B.A. (VEP01599A)

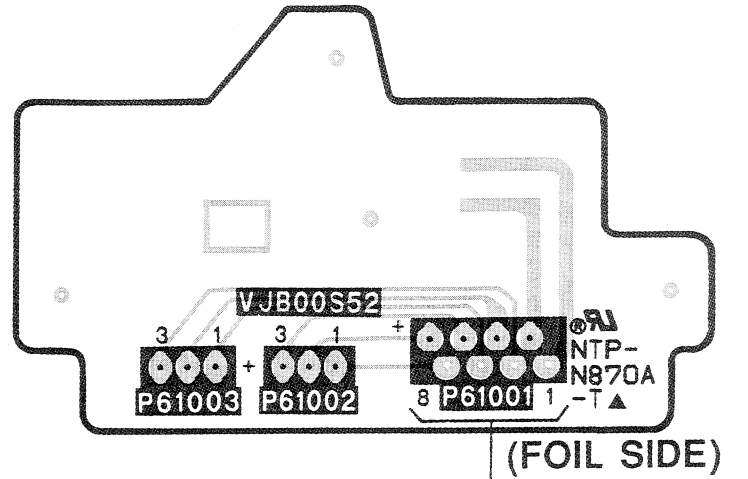
REEL DRIVE C.B.A. (VEP02399A)



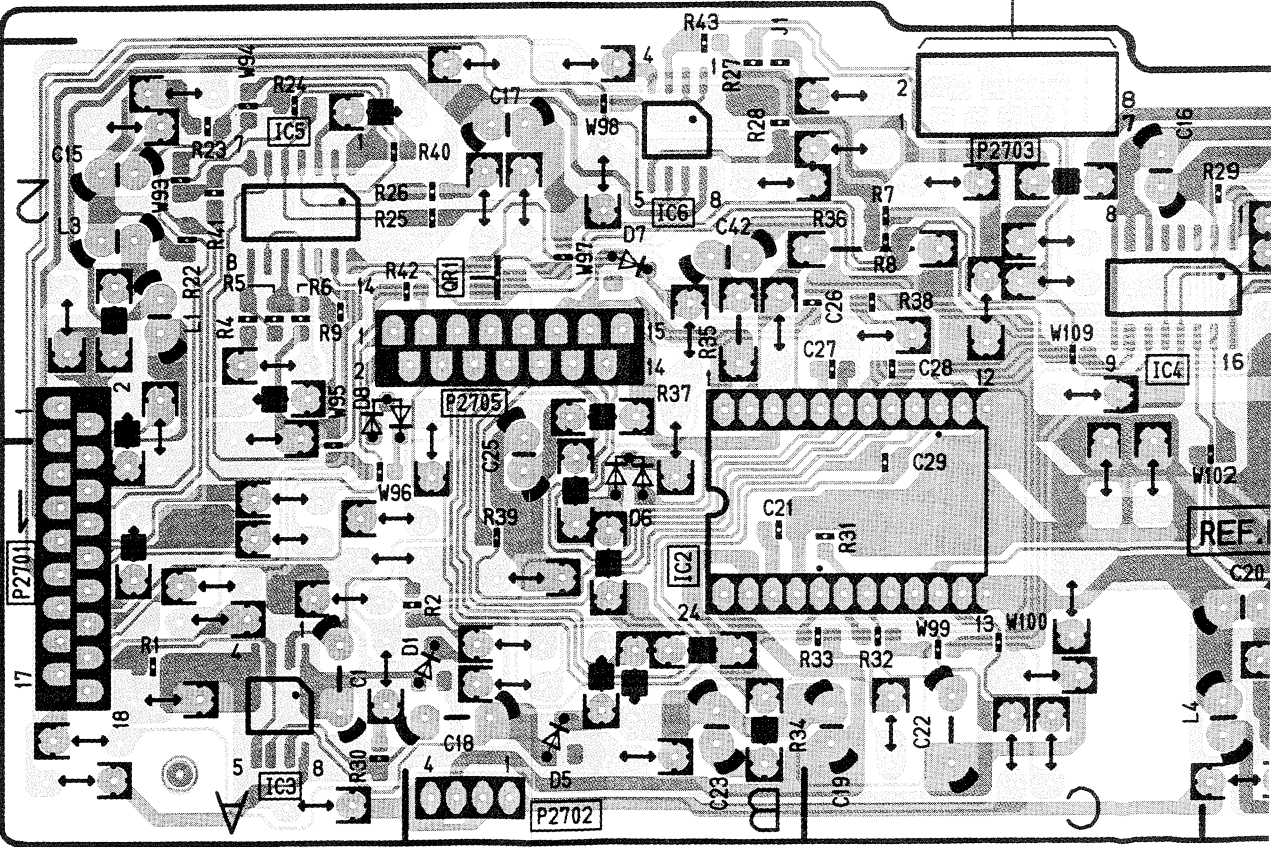
POWER	
Transistor	
Q1001	C-2
Integrated Circuit	
IC1001	C-3
IC1002	B-1
Test Point	
TP1001	C-5
TP1002	C-4
Connector	
P1001	A-4
P1002	A-1
P1003	A-2
P1101	A-6
P1102	A-5

ADDRESS INFORMATION

SOLENOID UNIT (VXA4840)

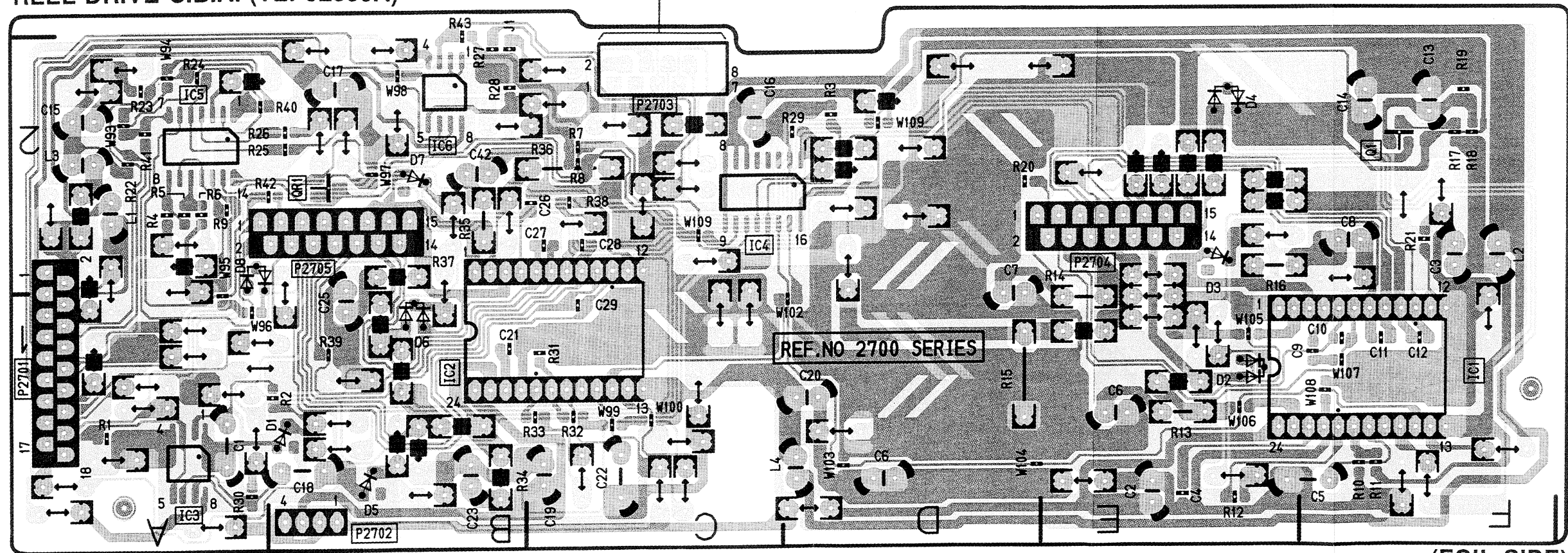


REEL DRIVE C.B.A. (VEP02399A)



[illegible]

REEL DRIVE C.B.A. (VEP02399A)

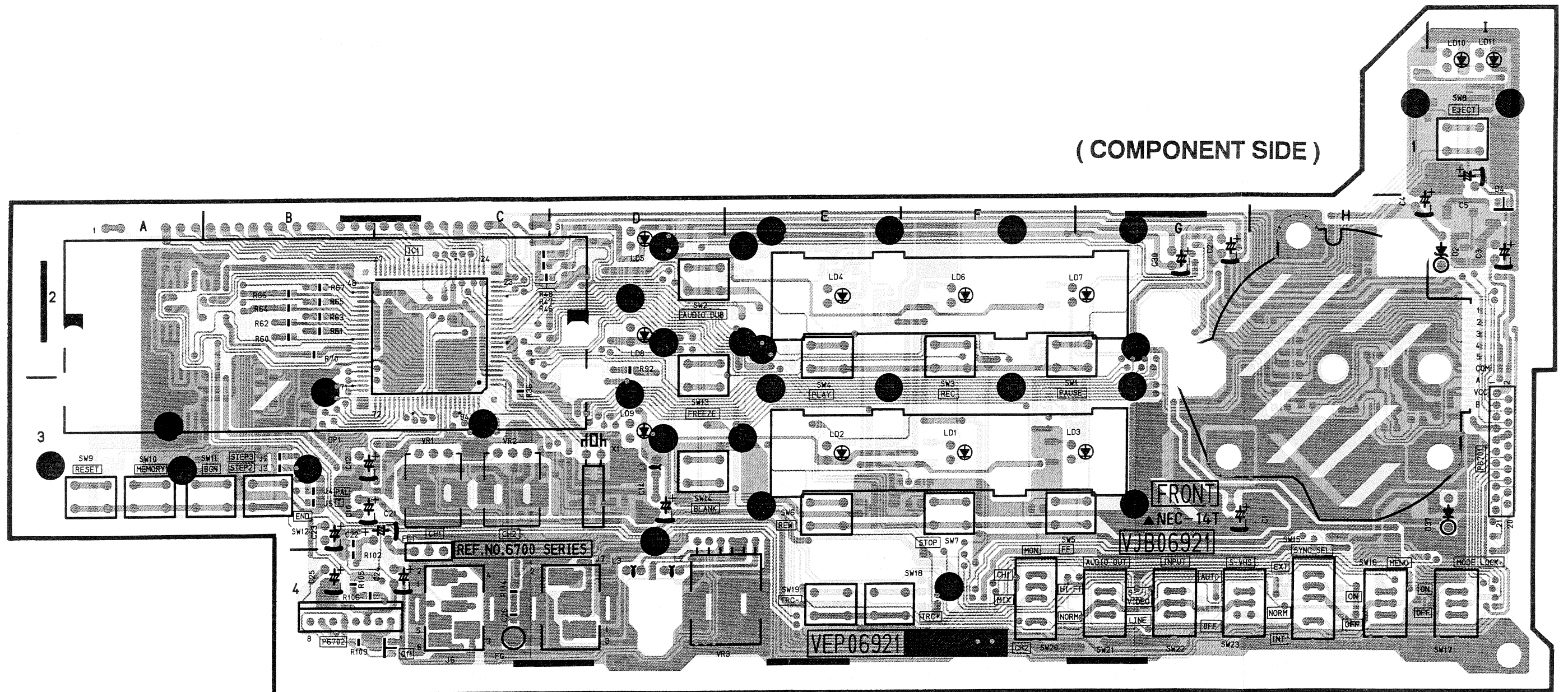


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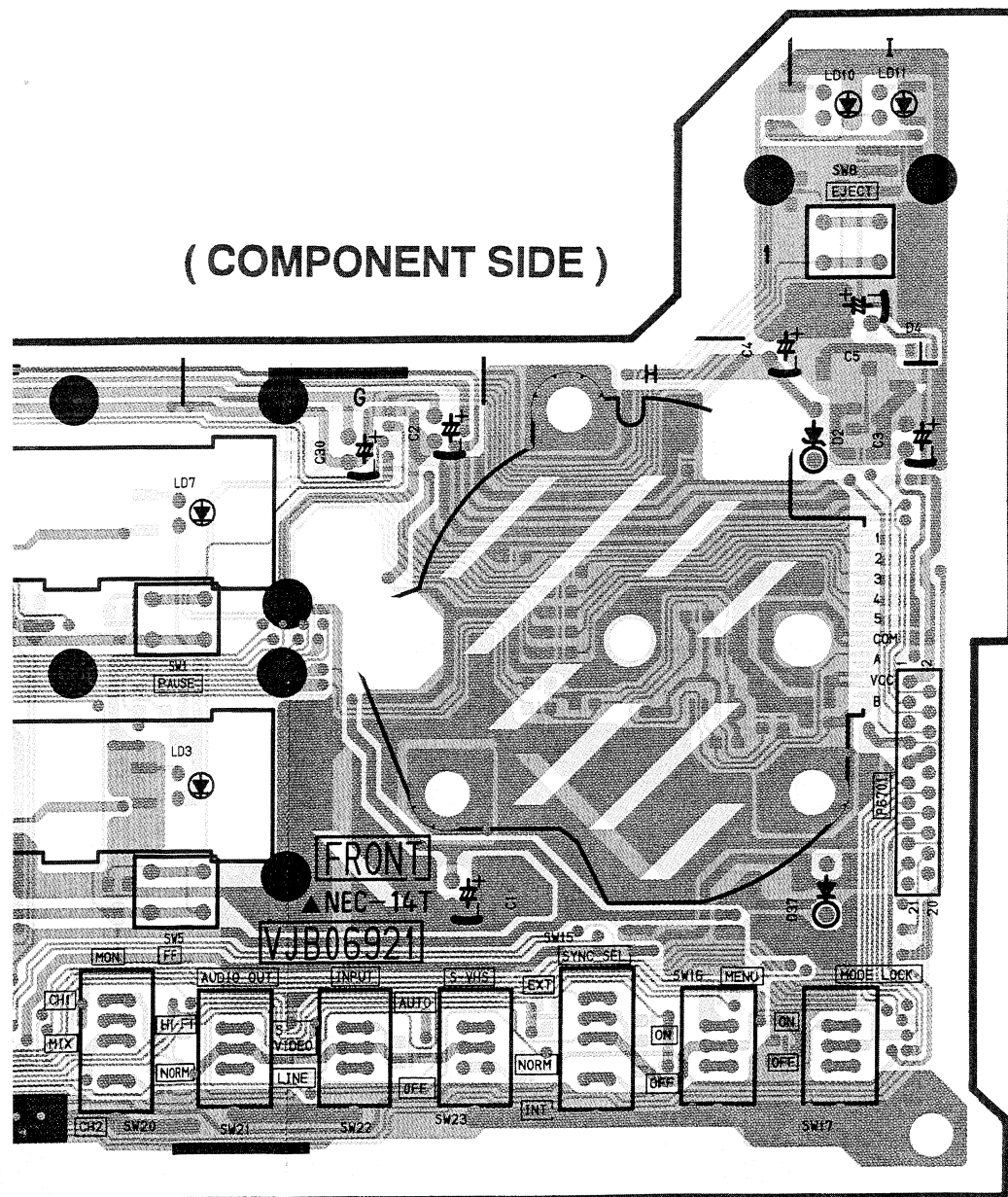
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Transistor		IC2703	A-1	
		IC2704	B-3	
Q2701	B-5	IC2705	B-1	
		IC2706	B-2	
Transistor & Resistor		Connector		
QR2701	B-2			
Integrated Circuit		P2701	A-1	
		P2702	A-2	
		P2703	B-3	
		P2704	B-4	
IC2701	A-5	P2705	B-2	
IC2702	A-2			

ADDRESS INFORMATION

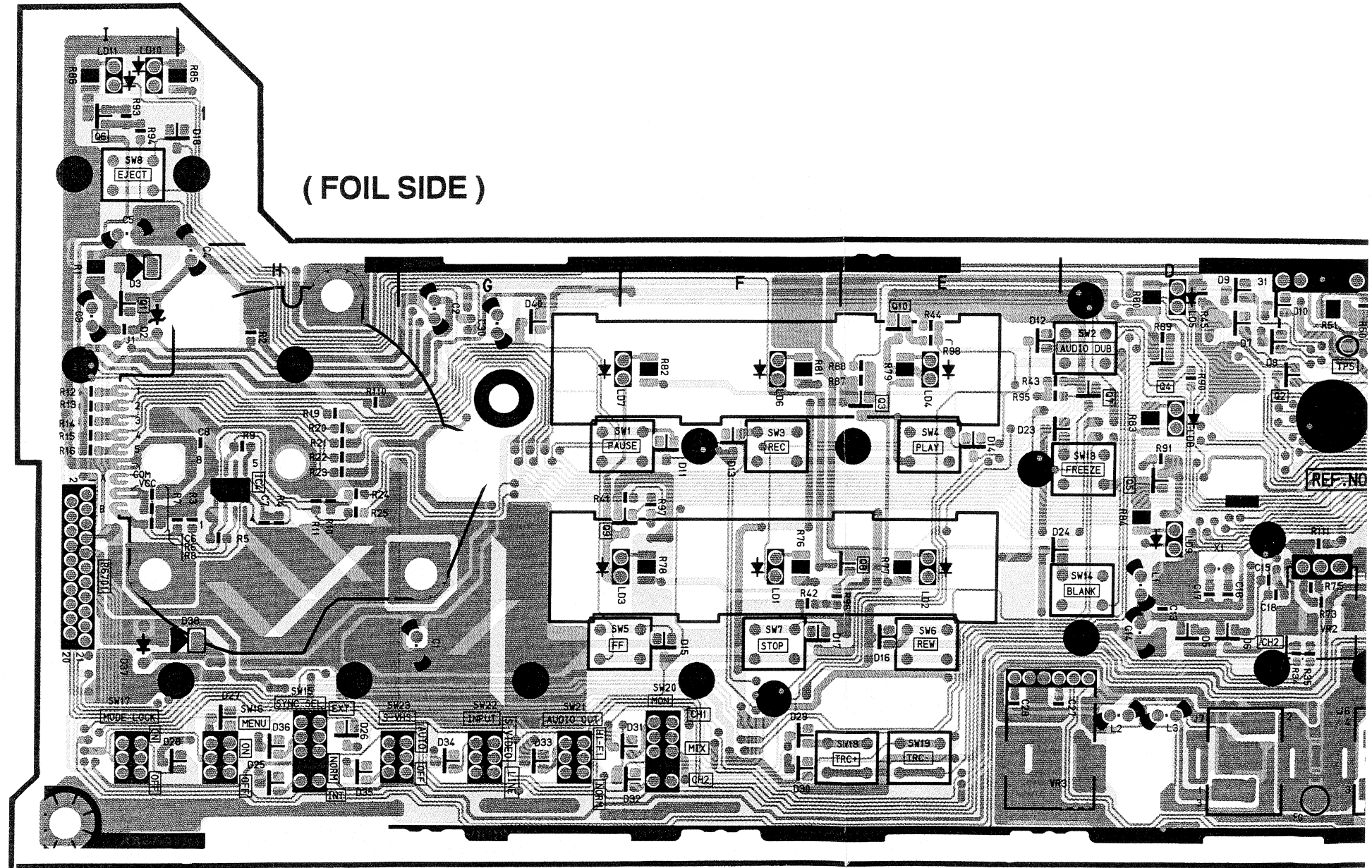
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(COMPONENT SIDE)



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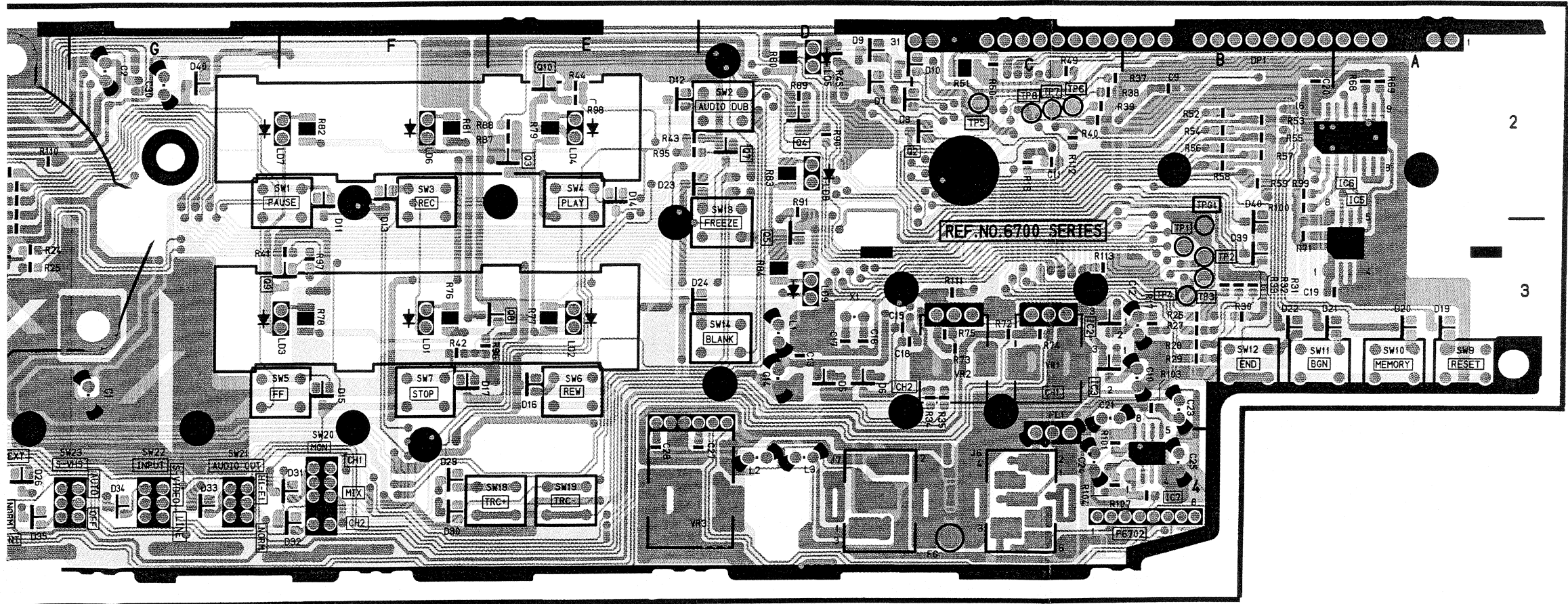
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FOIL SIDE)



FOIL SIDE

COMPONENT SIDE

FRONT	
Transistor	
Q6701	I-2
Q6702	C-2
Q6703	E-2
Q6704	D-2
Q6705	D-3
Q6706	I-1
Q6707	D-2
Q6708	E-3
Q6709	G-3
Q6710	E-2
Integrated Circuit	
IC6702	C-3
IC6703	C-3
IC6704	H-3
IC6705	A-2
IC6706	A-2
IC6707	B-4
Test Point	
TP6701	B-3
TP6702	B-3
TP6703	B-3
TP6704	B-3
TP6705	C-2
TP6706	C-2
TP6707	C-2
TP6708	C-2
TP6701	B-3
Adjustment	
VR6701	C-3
VR6702	C-3
VR6703	E-4

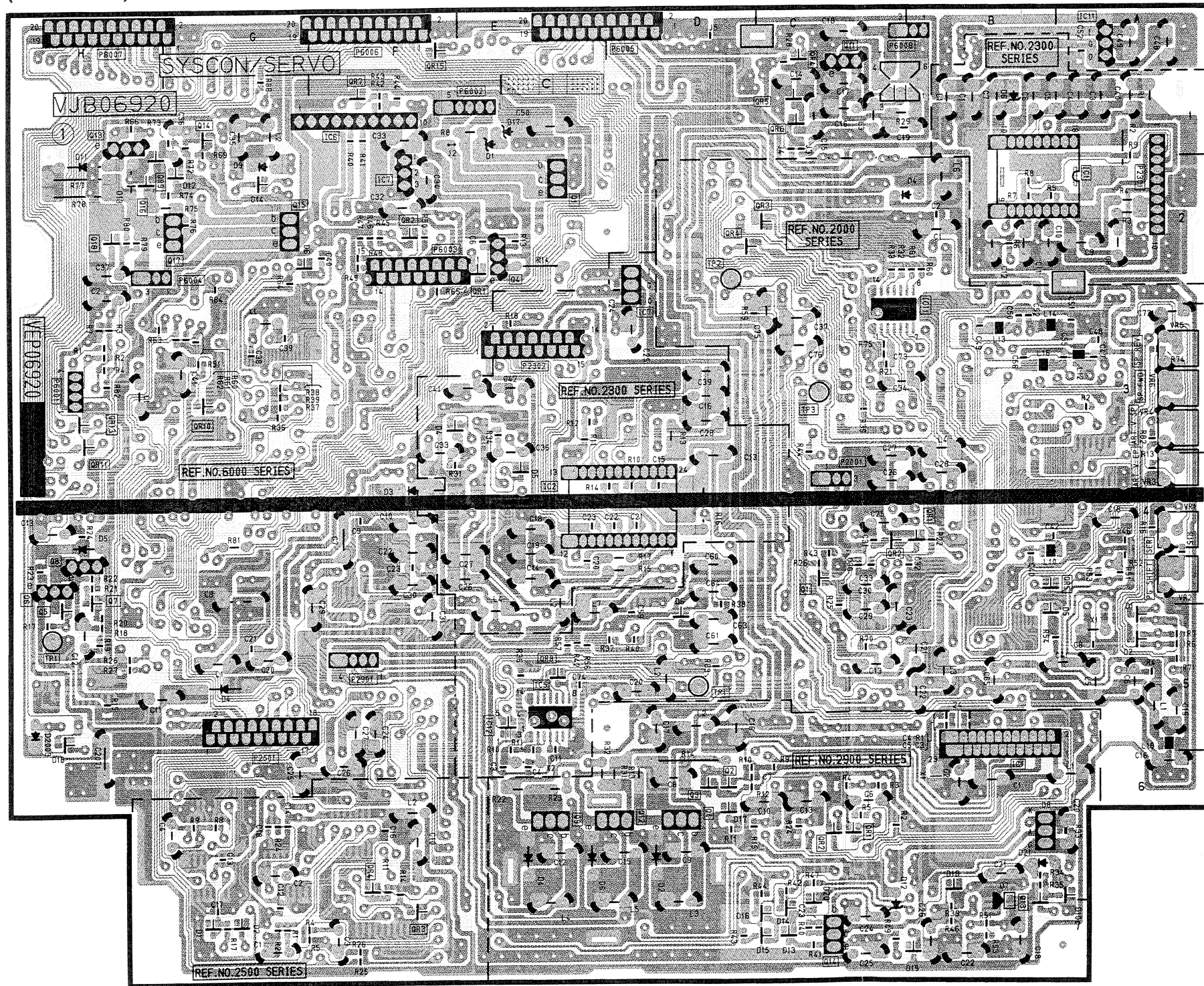
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Transistor	
Q6711	C-3
Integrated Circuit	
IC6701	C-2
Adjustment	
VR6701	C-3
VR6702	C-3
VR6703	E-4
Connector	
P6701	I-3
P6702	B-4

ADDRESS INFORMATION

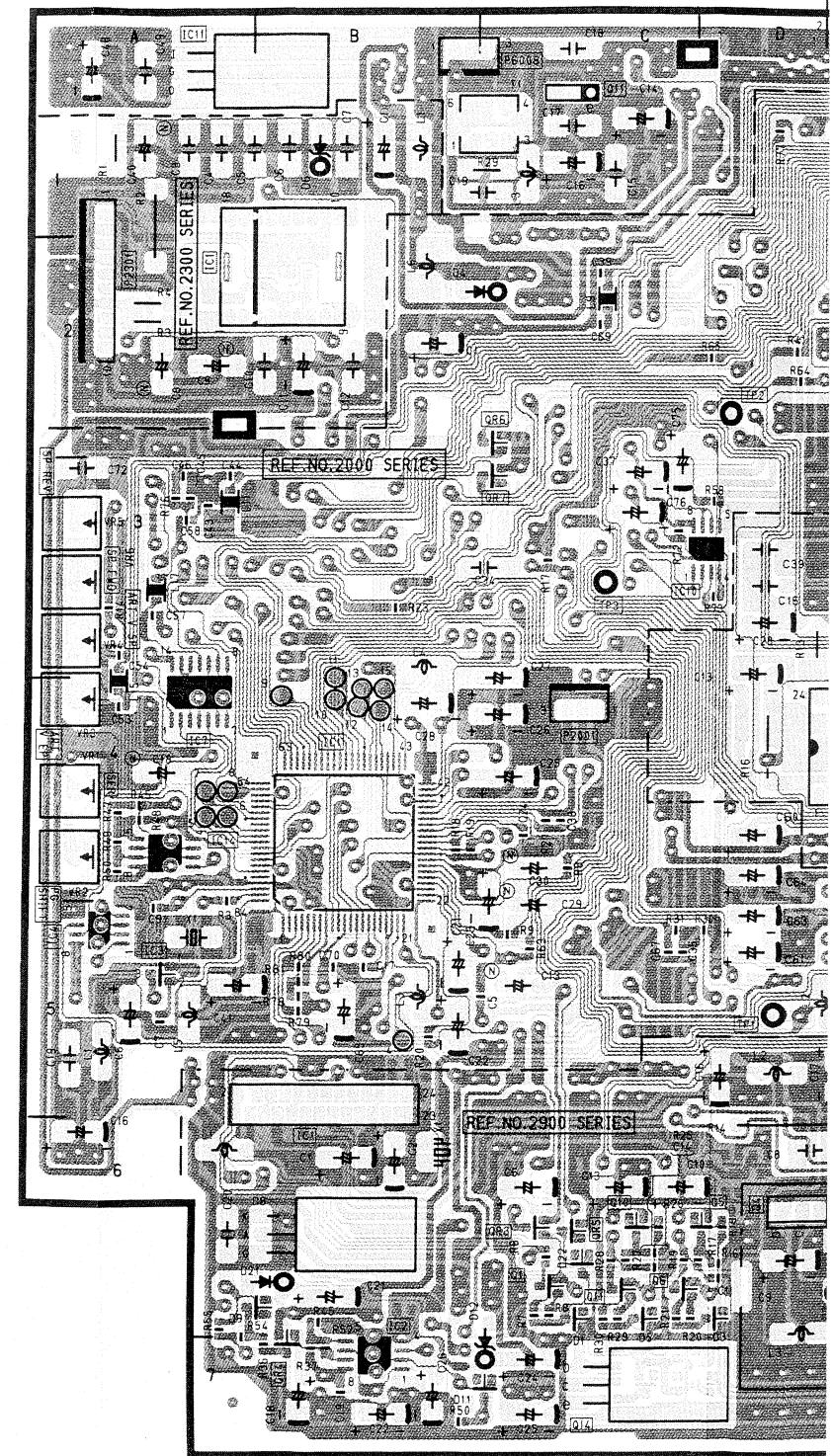
ADDRESS INFORMATION

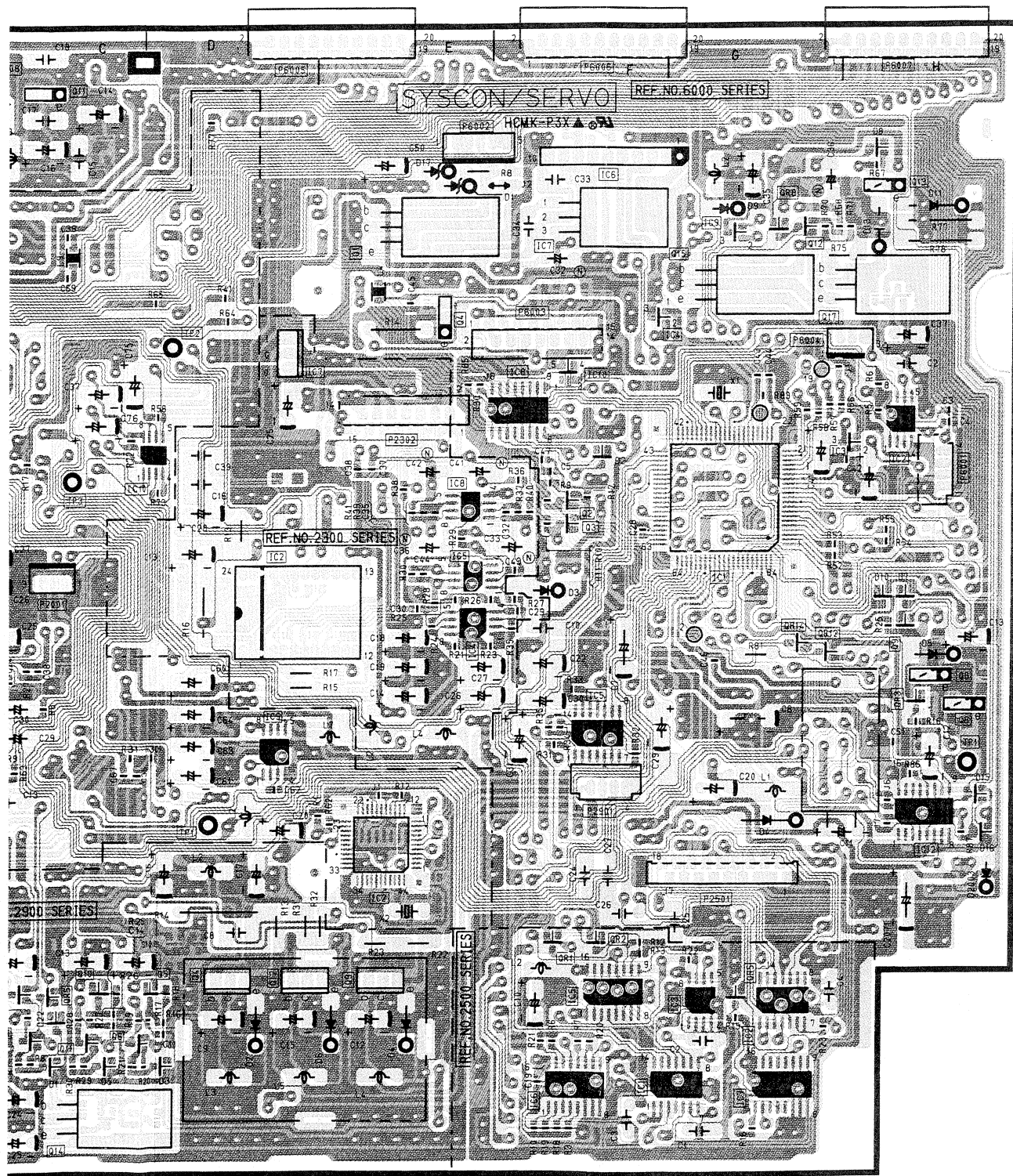
SYSTEM CONTROL & SERVO C.B.A. (VEP06920B)

(FOIL SIDE)



(COMPONENT SIDE)





COMPONENT SIDE

SYSTEM CONTROL & SERVO			
Transistor		Integrated Circuit	
Q2901	C-6	IC2308	E-3
Q2904	D-6	IC2501	G-7
Q2905	D-6	IC2502	G-6
Q2906	C-6	IC2503	G-6
Q2909	E-6	IC2505	F-6
Q2910	C-6	IC2506	F-6
Q2911	C-6	IC2507	G-7
Q2912	D-6	IC2901	B-5
Q2914	C-7	IC2902	B-7
Q6001	E-2	IC6001	A-2
Q6002	F-3	IC6001	G-3
Q6003	F-3	IC6002	H-3
Q6004	E-2	IC6003	H-3
Q6006	H-4	IC6005	F-4
Q6008	H-4	IC6006	F-1
Q6009	H-4	IC6007	F-2
Q6011	C-1	IC6008	F-3
Q6012	G-2	IC6009	G-2
Q6013	H-1	IC6010	F-3
Q6015	G-2	IC6011	A-1
Q6017	H-2	IC6012	H-5
		Test Point	
Transistor & Resistor		TP2001	D-5
QR2006	C-2	TP2002	D-2
QR2007	C-3	TP2003	C-3
QR2501	F-6	Adjustment	
QR2502	F-6	VR2001	A-4
QR2505	G-6	VR2002	A-4
QR2903	C-6	VR2003	A-4
QR2904	B-7	VR2004	A-3
QR2905	C-6	VR2005	A-3
QR6003	H-3	VR2006	A-3
QR6008	G-2	Connector	
QR6012	G-4	P2001	C-4
QR6014	G-4	P2301	A-2
Integrated Circuit		P2302	E-3
IC2001	A-4	P2501	G-5
IC2001	B-4	P2901	F-5
IC2002	E-5	P6001	H-3
IC2003	A-5	P6002	E-1
IC2004	A-5	P6003	F-2
IC2009	D-4	P6004	H-2
IC2014	A-4	P6005	D-1
IC2302	D-4	P6006	F-1
IC2304	E-4	P6007	H-1
IC2305	E-4	P6008	B-1
IC2307	D-2		

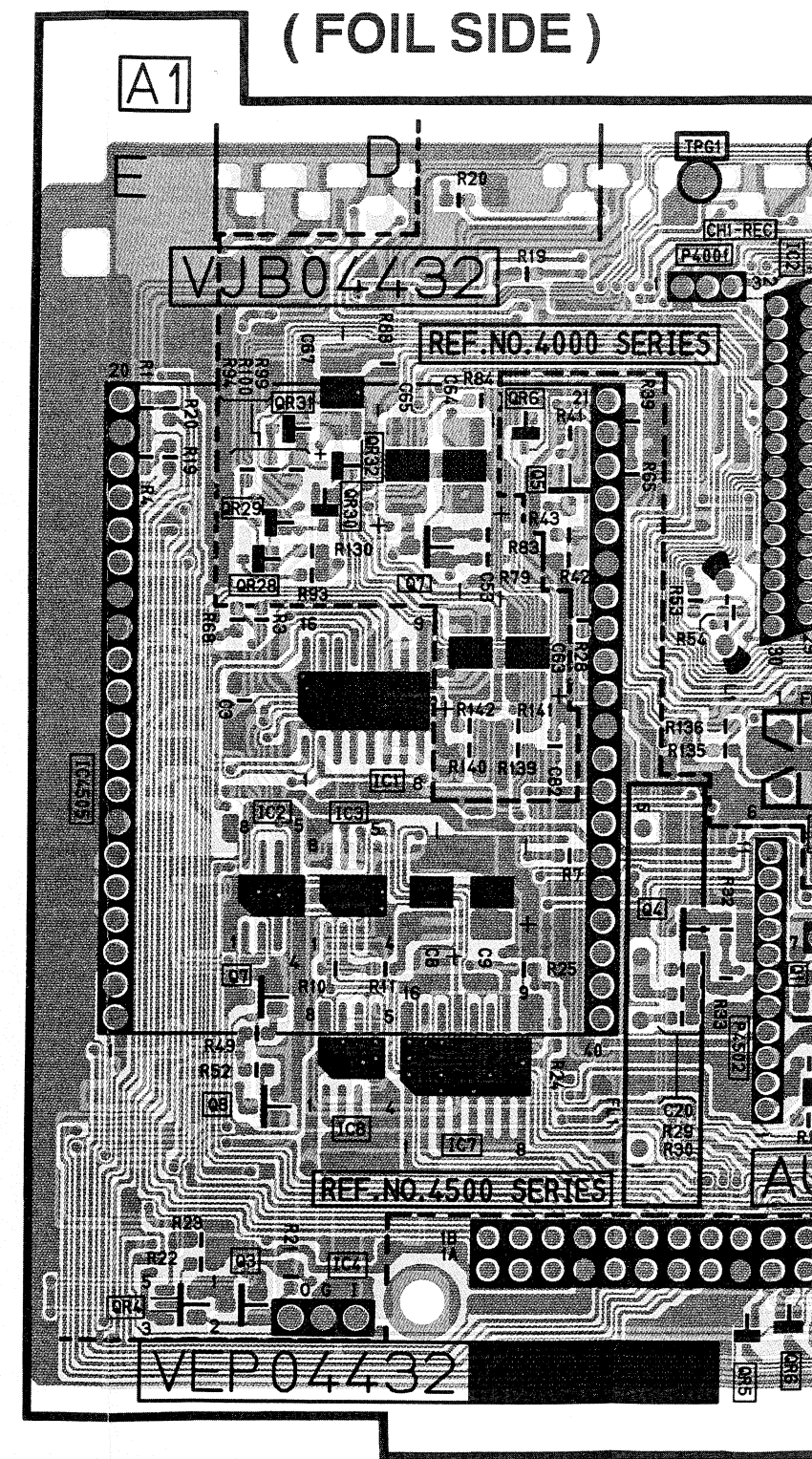
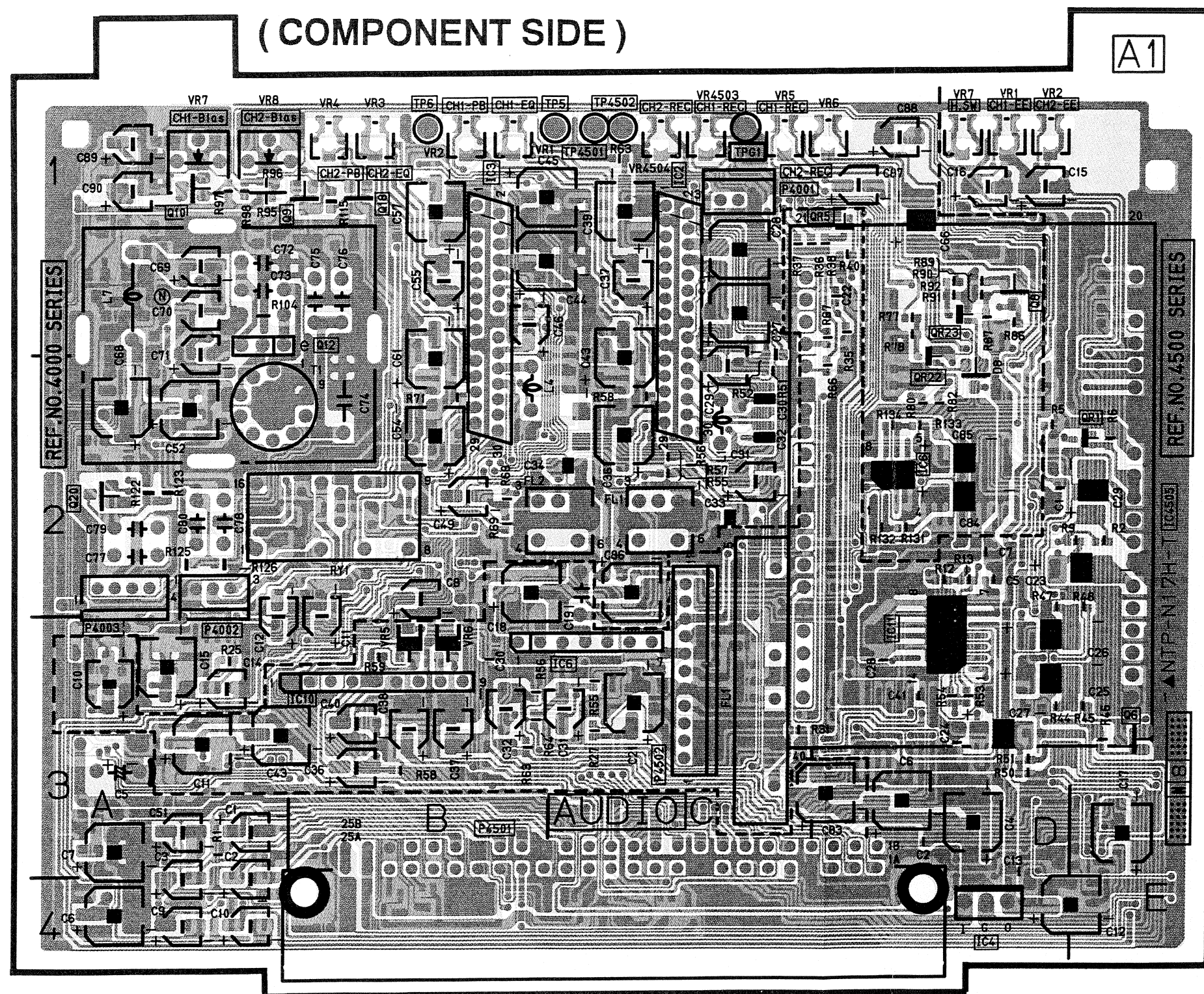
ADDRESS INFORMATION

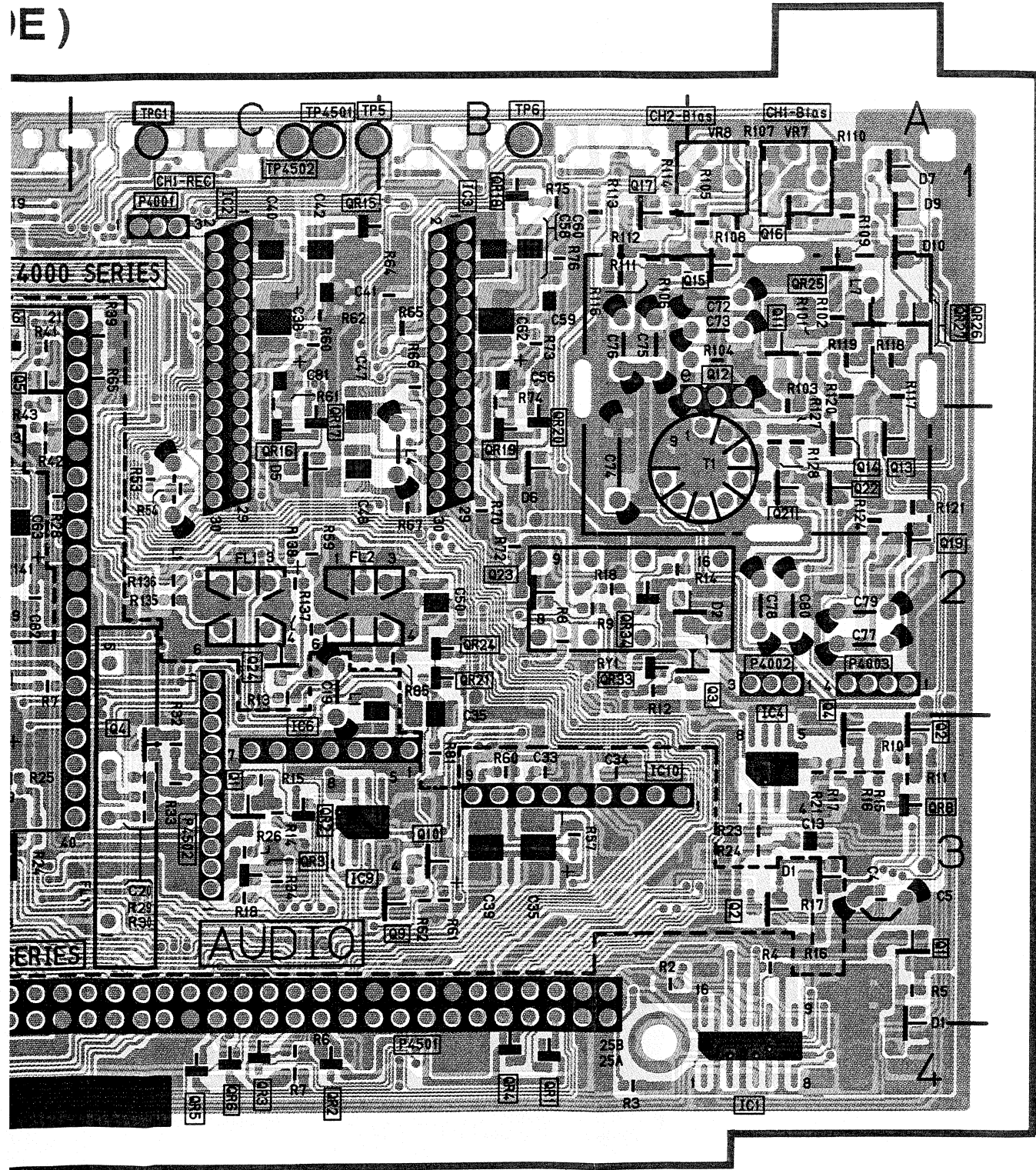
FOIL SIDE

SYSTEM CONTROL & SERVO			
Transistor		Integrated Circuit	
Q2001	C-4	IC2005	E-5
Q2902	E-6	IC2011	C-3
Q2903	E-6	IC2012	E-5
Q2904	E-6	IC2301	B-2
Q2909	E-6	IC2302	E-4
Q2912	E-6	IC2307	D-2
Q2913	B-6	IC2901	B-5
Q2914	C-7	IC6001	A-1
Q6001	E-2	IC6006	F-1
Q6004	E-2	IC6007	F-2
Q6005	H-4	Test Point	
Q6006	H-4	TP2001	D-5
Q6007	H-4	TP2002	D-2
Q6008	H-4	TP2003	C-3
Q6011	C-1	TP6001	H-5
Q6013	H-1	Adjustment	
Q6014	G-1	VR2001	A-4
Q6015	G-2	VR2002	A-4
Q6016	H-2	VR2003	A-4
Q6017	G-2	VR2004	A-3
Q6018	H-2	VR2005	A-3
Transistor & Resistor		VR2006	A-3
QR2001	B-4	Connector	
QR2002	C-4	P2001	C-4
QR2003	C-2	P2301	A-2
QR2004	D-2	P2302	E-3
QR2005	A-4	P2501	G-5
QR2008	E-5	P2901	F-5
QR2503	F-7	P6001	H-3
QR2504	F-6	P6002	E-1
QR2901	C-6	P6003	F-2
QR2902	C-6	P6004	H-2
QR6001	E-2	P6005	E-1
QR6002	F-2	P6006	F-1
QR6004	C-1	P6007	H-1
QR6005	C-1	P6008	C-1
QR6006	C-1		
QR6007	F-1		
QR6009	H-2		
QR6010	G-3		
QR6011	H-3		
QR6013	H-3		
QR6015	F-1		

ADDRESS INFORMATION

AUDIO C.B.A. (VEP04432B)





FOIL SIDE

AUDIO 1									
Transistor		QR4019		B-2		Test Point			
Q4001	A-3	QR4020	B-2	TP4005	C-1				
Q4002	A-3	QR4021	B-2	TP4006	B-1				
Q4003	A-2	QR4024	B-2	TP4501	C-1				
Q4004	A-3	QR4025	A-1	TP4502	C-1				
Q4007	D-2	QR4026	A-1	TPG4001	C-1				
Q4011	A-1	QR4027	A-1	Connector					
Q4012	A-1	QR4028	D-2	P4001	C-1				
Q4013	A-2	QR4029	D-2	P4002	A-2				
Q4014	A-2	QR4030	D-2	P4003	A-2				
Q4015	A-1	QR4031	D-1	P4501	C-3				
Q4016	A-1	QR4032	D-1	P4502	C-3				
Q4017	B-1	QR4033	B-2						
Q4019	A-2	QR4034	B-2						
Q4021	A-2	QR4502	C-3						
Q4022	A-2	QR4503	C-3						
Q4023	B-2	QR4504	E-1						
Q4024	C-2	QR4506	D-1						
Q4501	C-3	Integrated Circuit							
Q4502	A-3	IC4001	A-1						
Q4503	D-4	IC4002	C-1						
Q4504	C-3	IC4003	B-1						
Q4505	D-1	IC4004	A-3						
Q4507	D-3	IC4501	D-2						
Q4508	D-3	IC4502	D-3						
Q4509	B-3	IC4503	D-3						
Q4510	B-3	IC4504	D-4						
Transistor & Resistor		IC4505	D-2						
QR4001	B-4	IC4506	C-3						
QR4002	C-4	IC4507	D-3						
QR4003	C-4	IC4508	D-3						
QR4004	B-4	IC4509	C-3						
QR4005	C-4	IC4510	B-3						
QR4006	C-4	Adjustment							
QR4008	A-3	VR4007	A-1						
QR4015	C-1	VR4008	A-1						
QR4016	C-2								
QR4017	C-2								
QR4018	B-1								

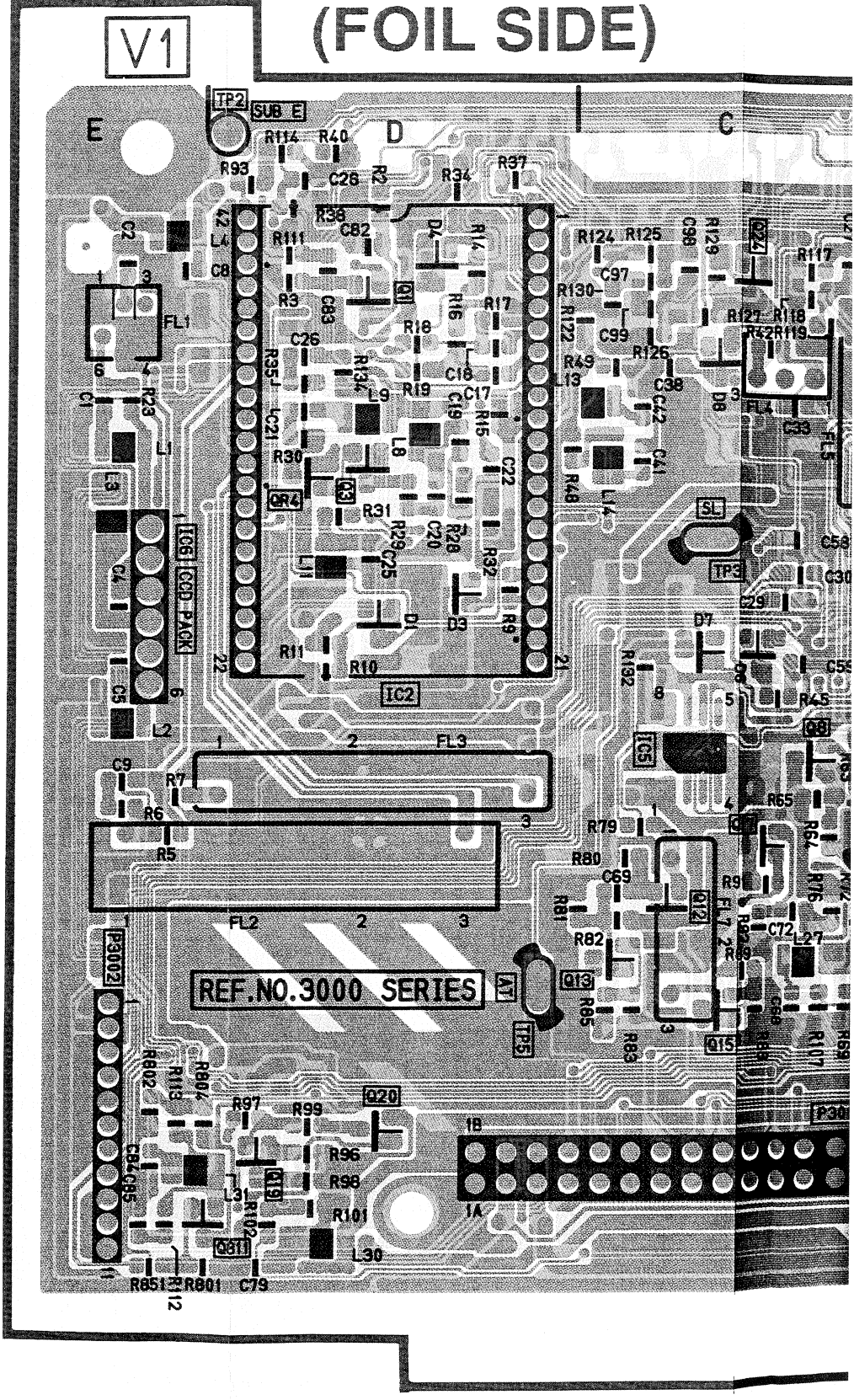
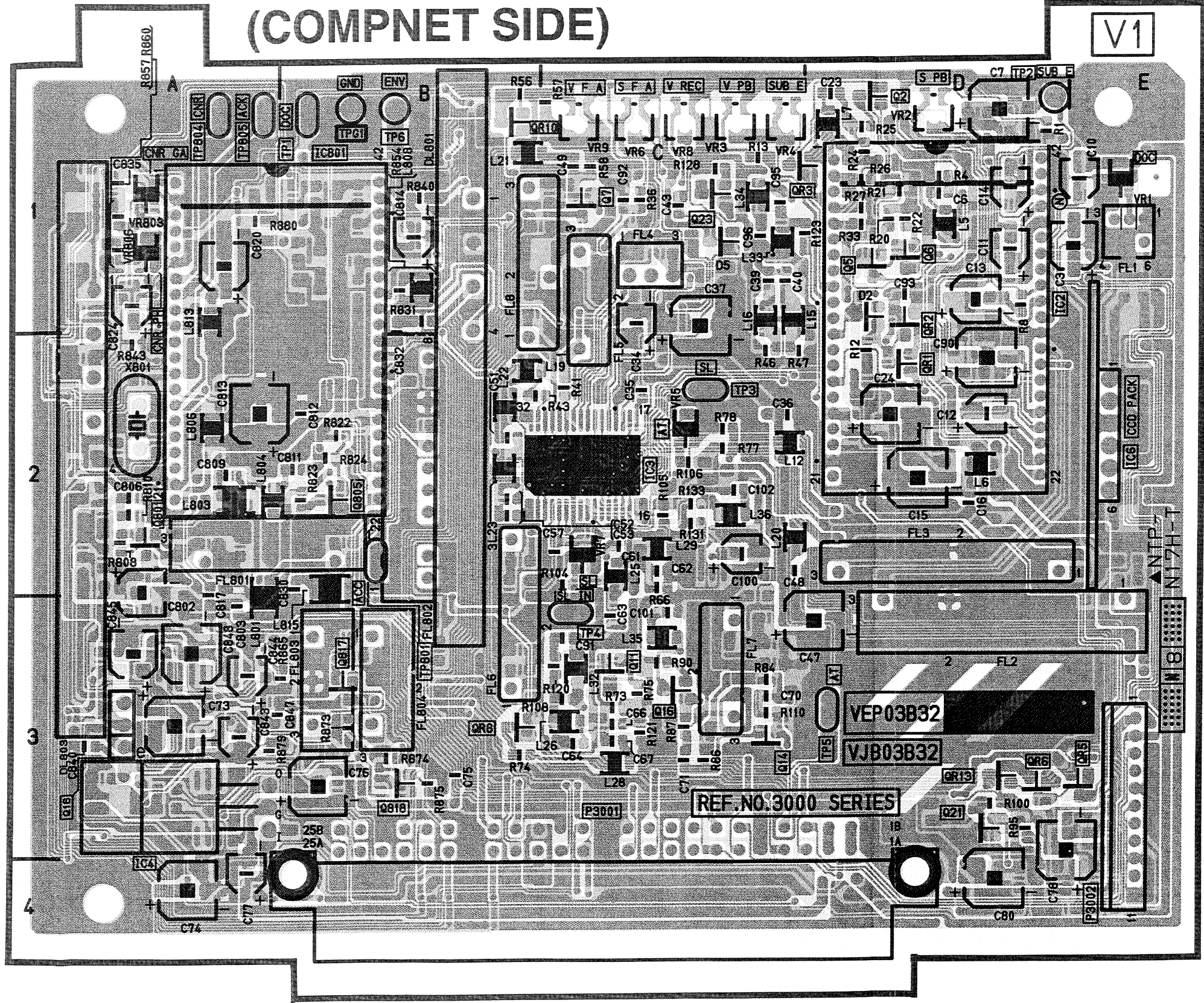
ADDRESS INFORMATION

COMPONENT SIDE

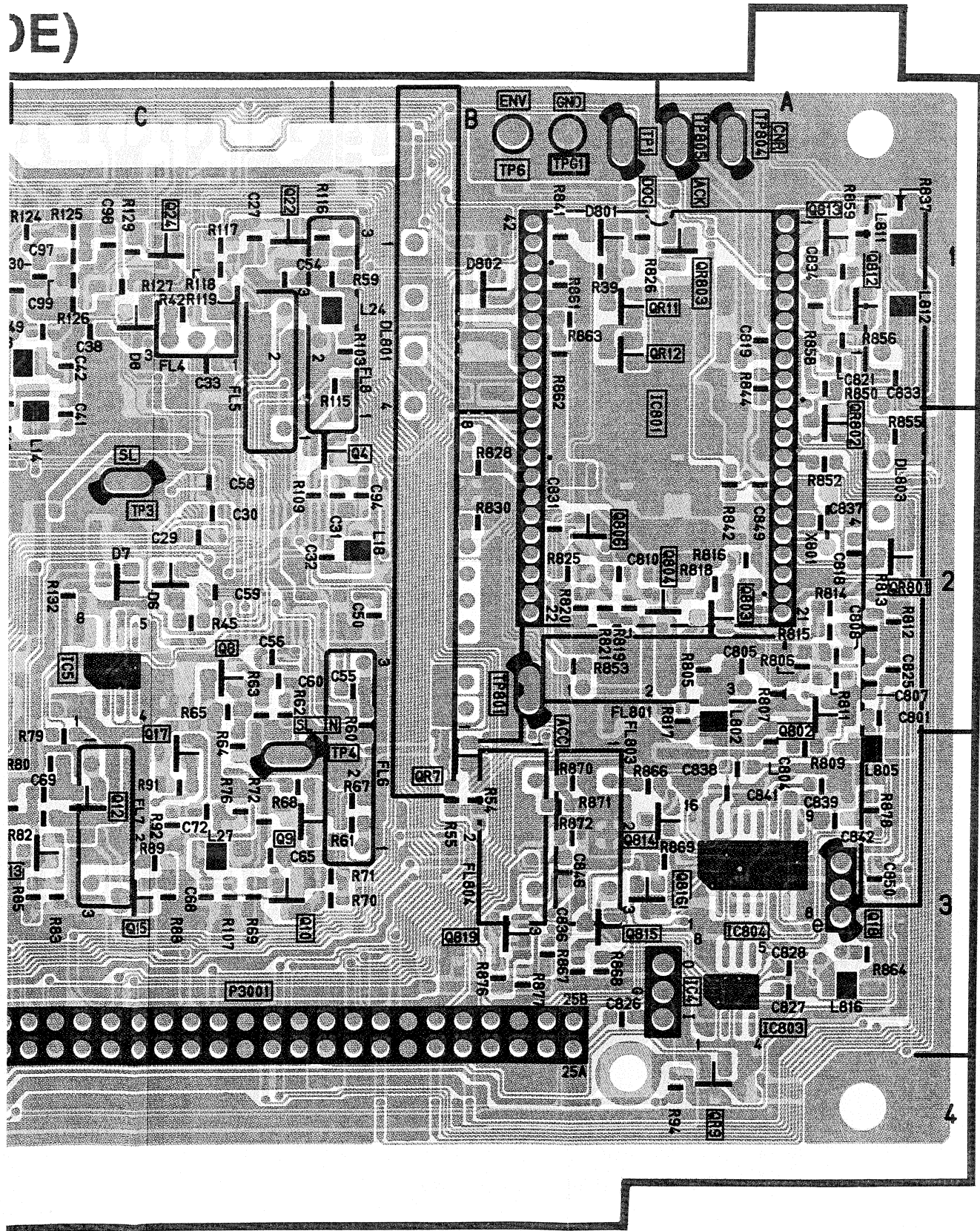
AUDIO 1				
Transistor		VR4004		B-1
Q4009	A-1	VR4005		C-1
Q4010	A-1	VR4006		D-1
Q4012	B-1	VR4007		A-1
Q4018	B-1	VR4008		A-1
Q4020	A-2	VR4501		D-1
Q4506	E-3	VR4502		D-1
Q4508	D-1	VR4503		C-1
		VR4504		C-1
		VR4505		B-3
Transistor & Resistor		VR4506		B-3
		VR4507		D-1
QR4022	D-2	Test Point		
QR4023	D-1			
QR4501	E-2			
QR4505	D-1	TP4005	C-1	
		TP4006	B-1	
Integrated Circuit		TP4501	C-1	
IC4002	C-1	TP4502	C-1	
IC4003	B-1	TPG4001	C-1	
IC4006	D-2	Connector		
IC4504	D-4			
IC4506	C-3	P4001	C-1	
IC4510	B-3	P4002	A-2	
IC4511	D-3	P4003	A-3	
		P4501	C-3	
Adjustment		P4502	C-3	
VR4001	B-1			
VR4002	B-1			
VR4003	B-1			

ADDRESS INFORMATION

VIDEO (1) C.B.A. (VEP03B32A)



E)



COMPONENT SIDE

VIDEO 1			
Transistor		IC3006 IC3003	E-2 C-2
Q3801	A-2	Test Point	TP3804 TP3805 TP3001 TPG3001 TP3006 TP3801 TP3004 TP3003 TP3005 TP3002
Q3018	A-3		
Q3805	B-2		
Q3817	B-3		
Q3818	B-3		
Q3008	B-3		
Q3007	C-1		
Q3023	C-1		
Q3011	C-3		
Q3016	C-3		
Q3014	C-3		
Q3021	D-3		
Q3005	D-1		
Q3006	D-1		
Q3002	D-1		
Adjustment			
Transistor & Resistor		VR3002 VR3003 VR3005 VR3007 VR3001 VR3009 VR3006 VR3008 VR3004	D-1 C-1 C-2 C-2 E-1 C-1 C-1 C-1 C-1
QR3010	B-1		
QR3003	C-1		
QR3002	D-1		
QR3001	D-2		
QR3013	D-3		
QR3006	D-3		
QR3005	E-3		
Integrated Circuit		Conector	
IC3004	A-4	P3002	E-4
IC3801	B-1	P3001	E-3
IC3002	D-1		

ADDRESS INFORMATION

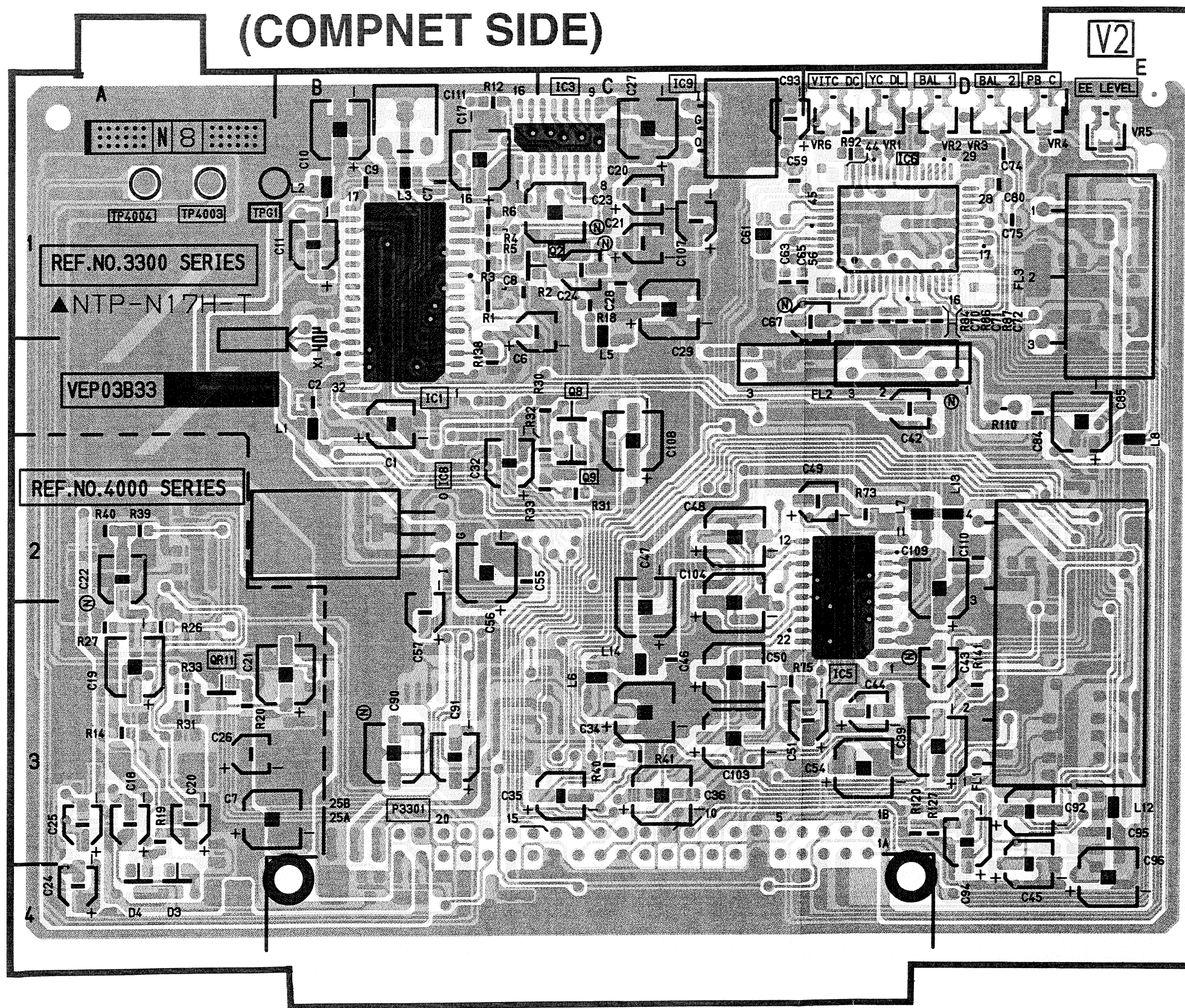
FOIL SIDE

VIDEO 1			
Transistor		QR3012 QR3803 QR3802 QR3801 QR3809 QR3004	B-1 A-1 A-2 A-2 A-4 D-2
Q3001	D-1	Integrated Circuit	IC3006 IC3002 IC3005 IC3804 IC3803 IC3801 IC3004
Q3003	D-2		
Q3020	D-3		
Q3019	D-3		
Q3811	D-4		
Q3024	C-1		
Q3022	C-1		
Q3008	C-2		
Q3017	C-3		
Q3012	C-3		
Q3013	C-3		
Q3015	C-3		
Q3009	C-3		
Q3010	C-3		
Q3004	B-2		
Q3806	B-2		
Q3804	A-2		
Q3813	A-1		
Q3803	A-2		
Q3802	A-2		
Q3007	B-3		
Q3819	B-3		
Q3814	B-3		
Q3815	B-3		
Q3811	D-4		
Q3816	A-3		
Q3018	A-3		
Q3812	A-1		
Transistor & esistor		Test Point	
QR3011	B-1	TP3005 TP3003 TPG3000 TPG3001 TP3001 TP3805 TP3804 TP3801 TP3004 TP3002	
		D-3 C-2 B-1 B-1 B-1 A-1 A-1 B-2 B-3 D-1	
		Connector	
		P3001 P3002	C-3 E-3

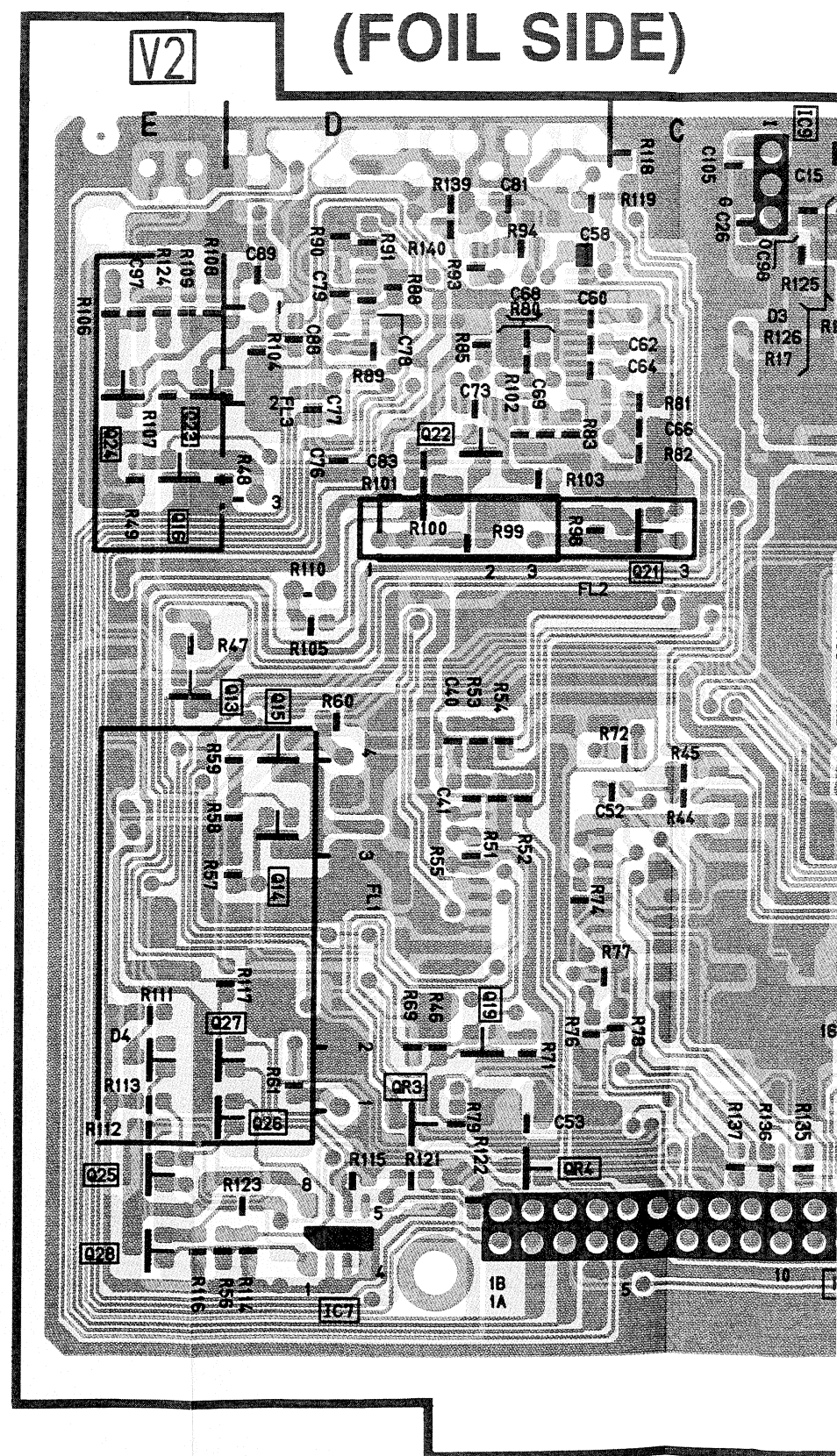
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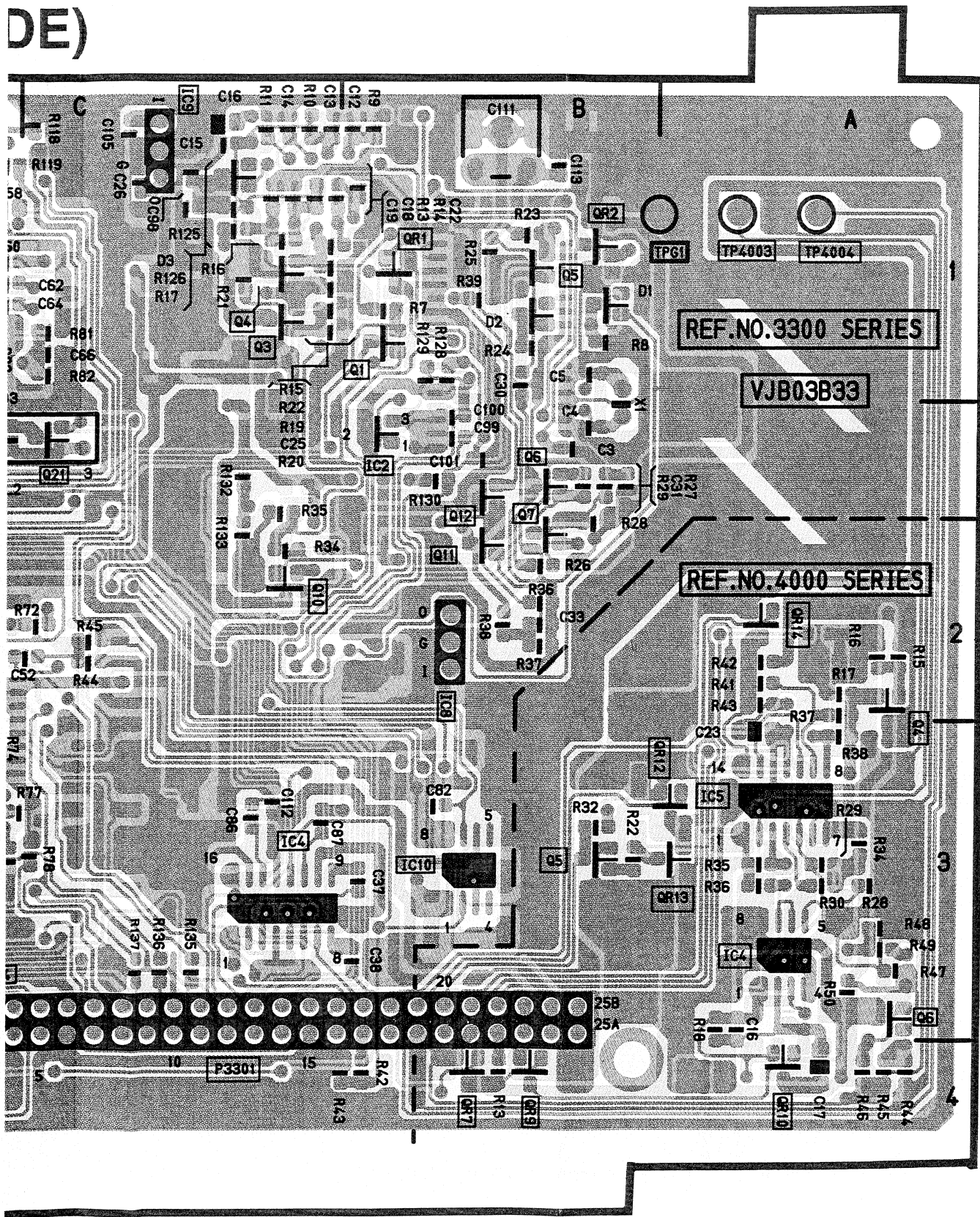
(COMPNET SIDE)



(FOIL SIDE)



DE)



COMPONENT SIDE

VIDEO 2	
Transistor	
Q3308	C-2
Q3309	C-2
Q3302	C-1
Transistor & Resistor	
QR4011	A-3
Integrated Circuit	
IC3301	B-2
IC3303	C-1
IC3309	C-1
IC3308	B-2
IC3305	D-3
IC3306	D-1
Test Point	
TP4004	A-1
TP4003	A-1
TPG3301	A-1
Adjustment	
VR3306	D-1
VR3301	D-1
VR3302	D-1
VR3303	D-1
VR3304	D-1
VR3305	E-1
C3411	B-1
Connector	
P3301	B-3

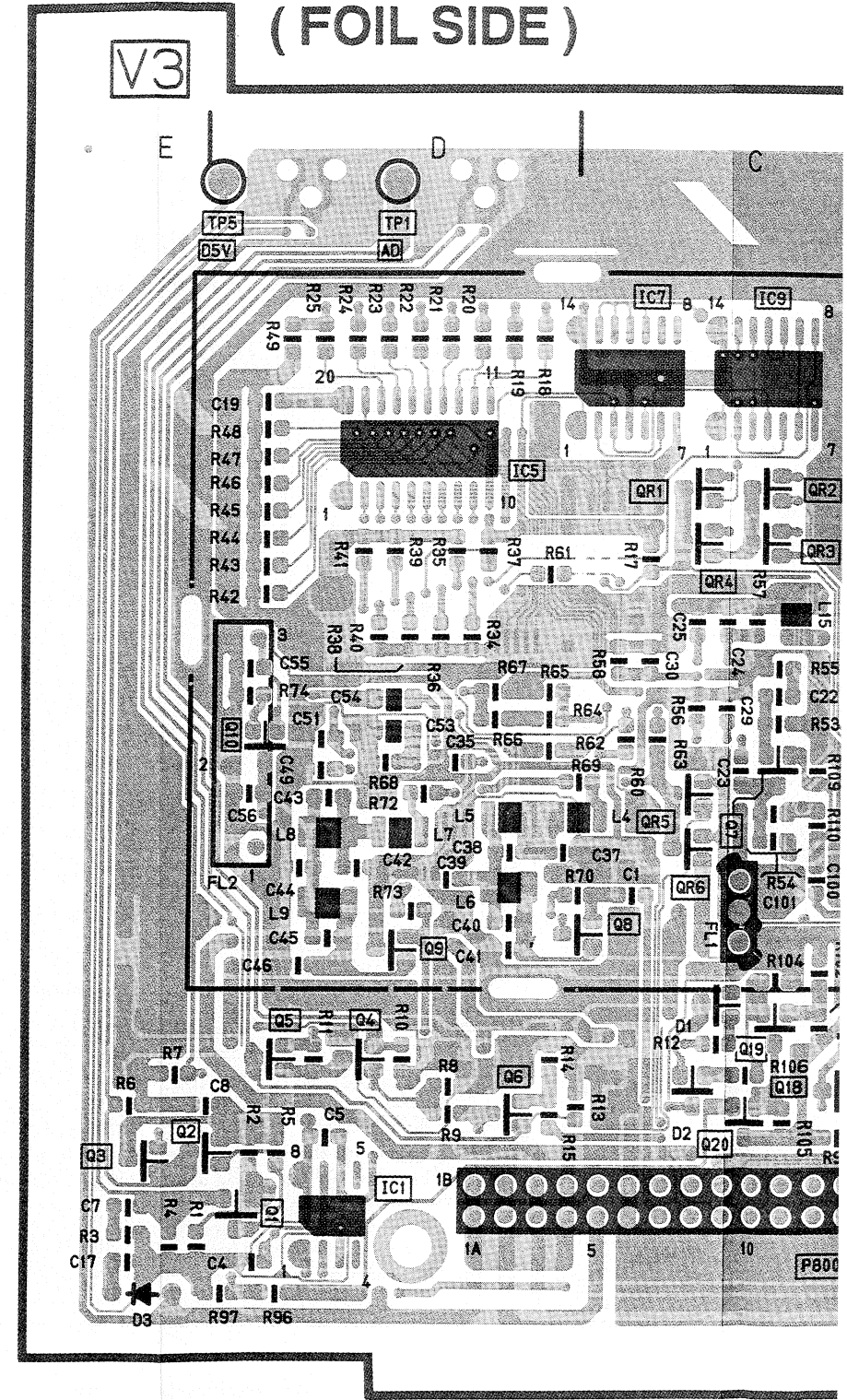
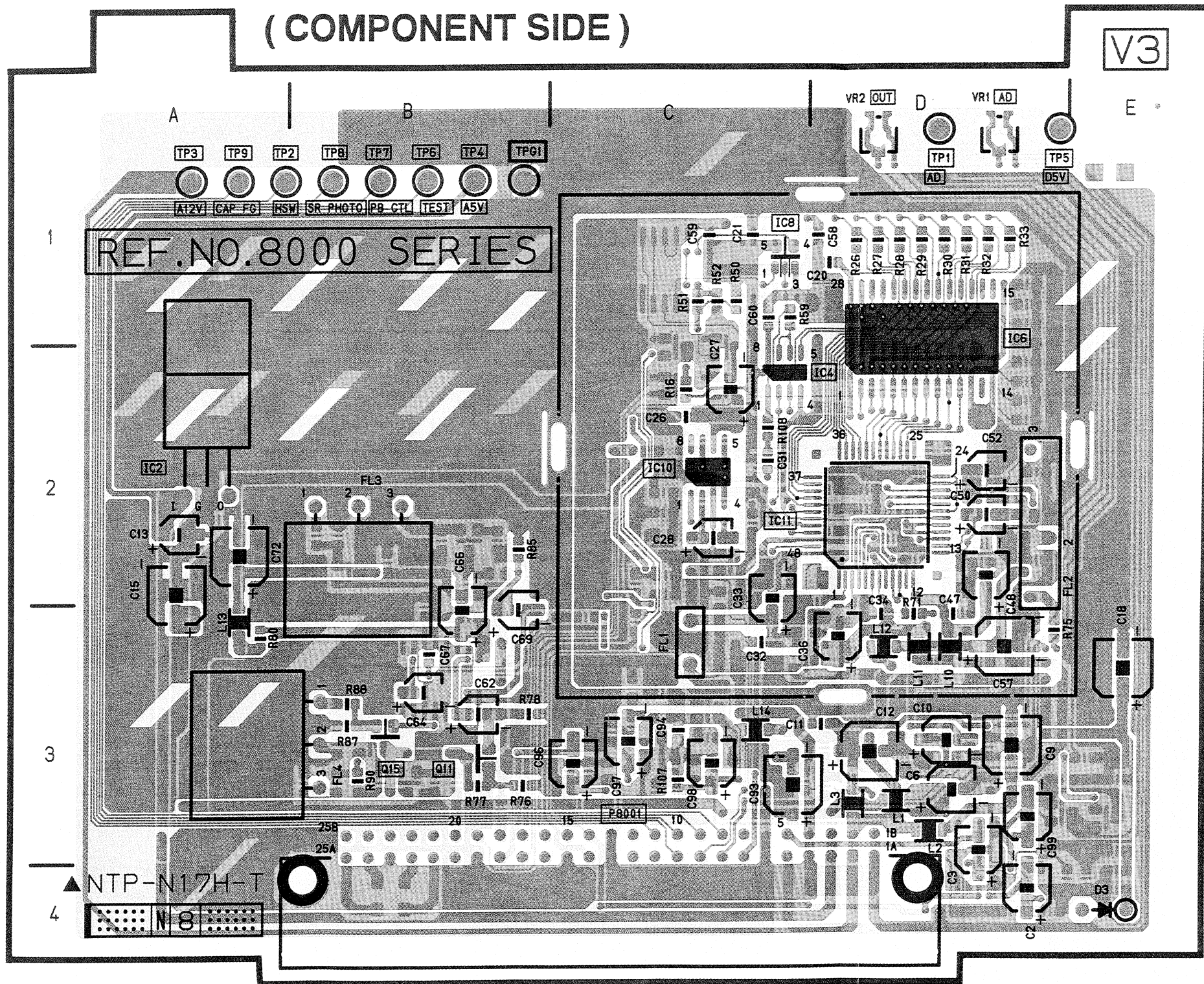
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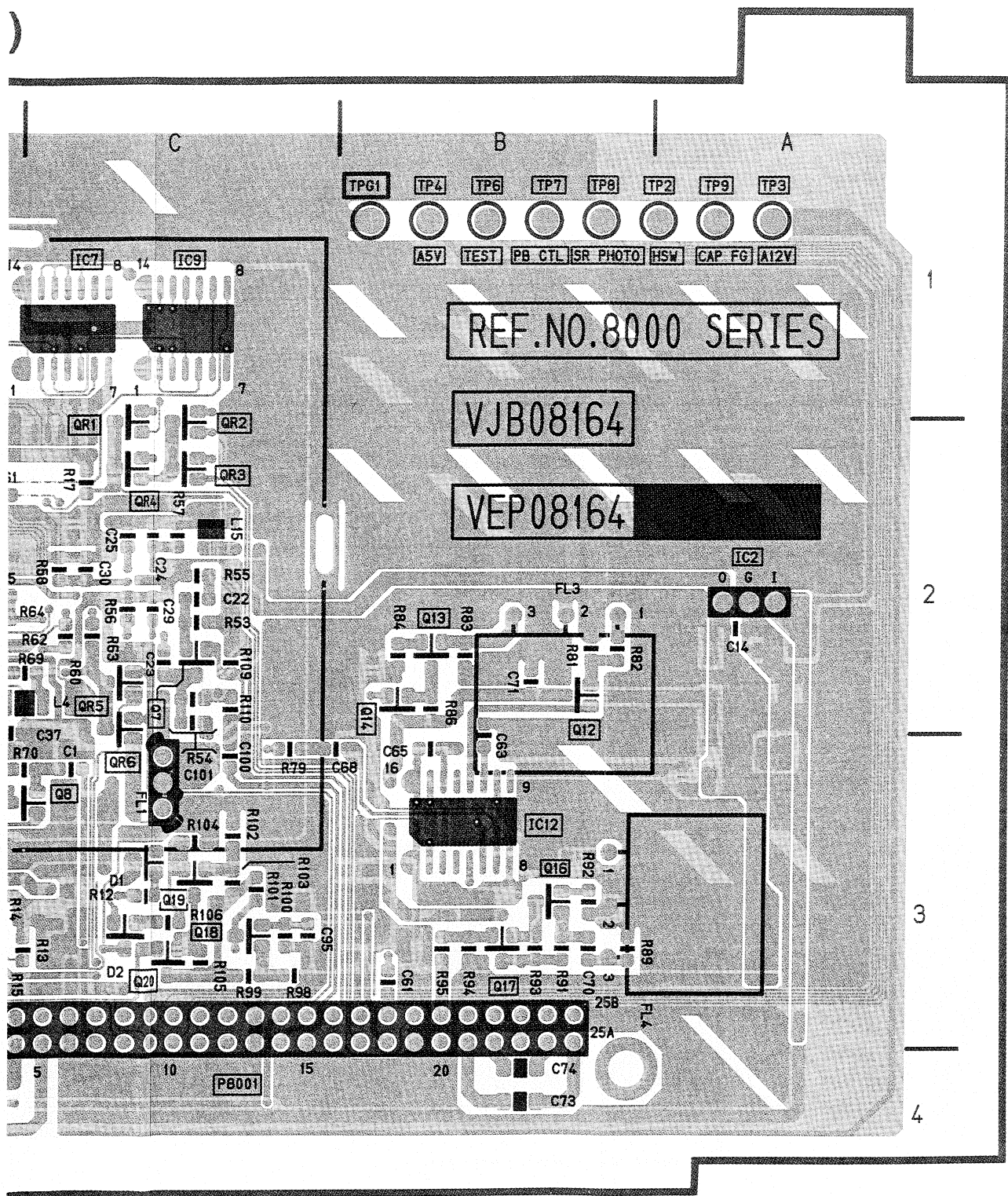
FOIL SIDE

VIDEO 2			
Transistor		QR3304	D-3
Q3324		QR3301	B-1
Q3323		QR3302	B-1
Q3316		QR4007	B-4
Q3322		QR4009	B-4
Q3313		QR4013	A-3
Q3315		QR4010	A-4
Q3314		QR4012	A-3
Q3327		QR4014	A-2
Q3326		Integrated Circuit	
Q3325		IC3307	D-4
Q3328		IC3309	C-1
Q3319		IC3304	C-3
Q3321		IC3310	B-3
Q3304		IC3308	B-2
Q3303		IC3302	B-2
Q3301		IC4005	A-3
Q3310		IC4004	A-3
Q4005		Test Point	
Q3311		TP4003	A-1
Q3312		TP4004	A-1
Q3307		TPG3301	A-1
Q3306		Connector	
Q3305		P3301	C-4
Q4006		Transistor & Resistor	
Q4004		QR3303	D-3

ADDRESS INFORMATION

VIDEO (3) C.B.A. (VEP08164B)





COMPONENT SIDE

VIDEO 3	
Transistor	
Q8011	B-3
Q8015	B-3
Integrated Circuit	
IC8002	A-2
IC8004	C-2
IC8006	D-1
IC8008	C-1
IC8010	C-2
IC8011	C-2
Test Point	
TP8001	D-1
TP8002	A-1
TP8003	A-1
TP8004	B-1
TP8005	D-1
TP8006	B-1
TP8007	B-1
TP8008	B-1
TP8009	A-1
TP8001	B-1
Adjustment	
VR8001	D-1
VR8002	D-1
Connector	
P8001	C-1

ADDRESS INFORMATION

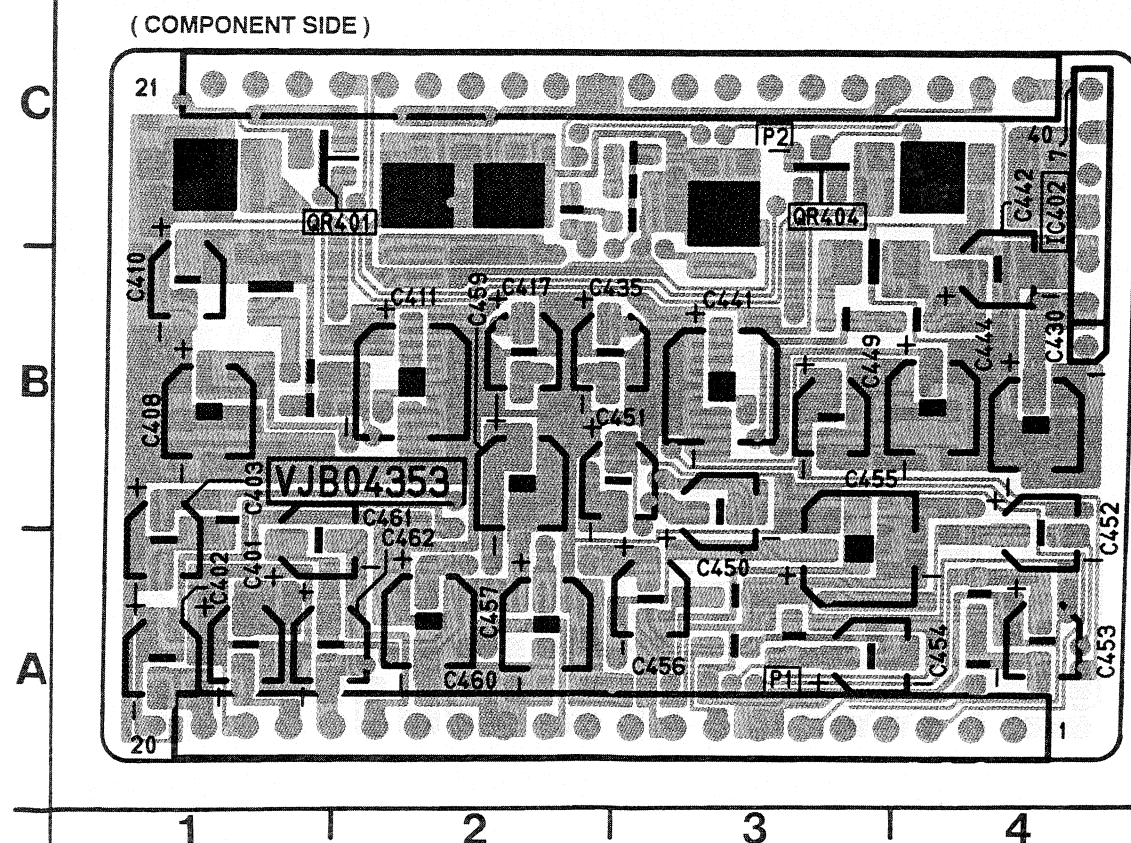
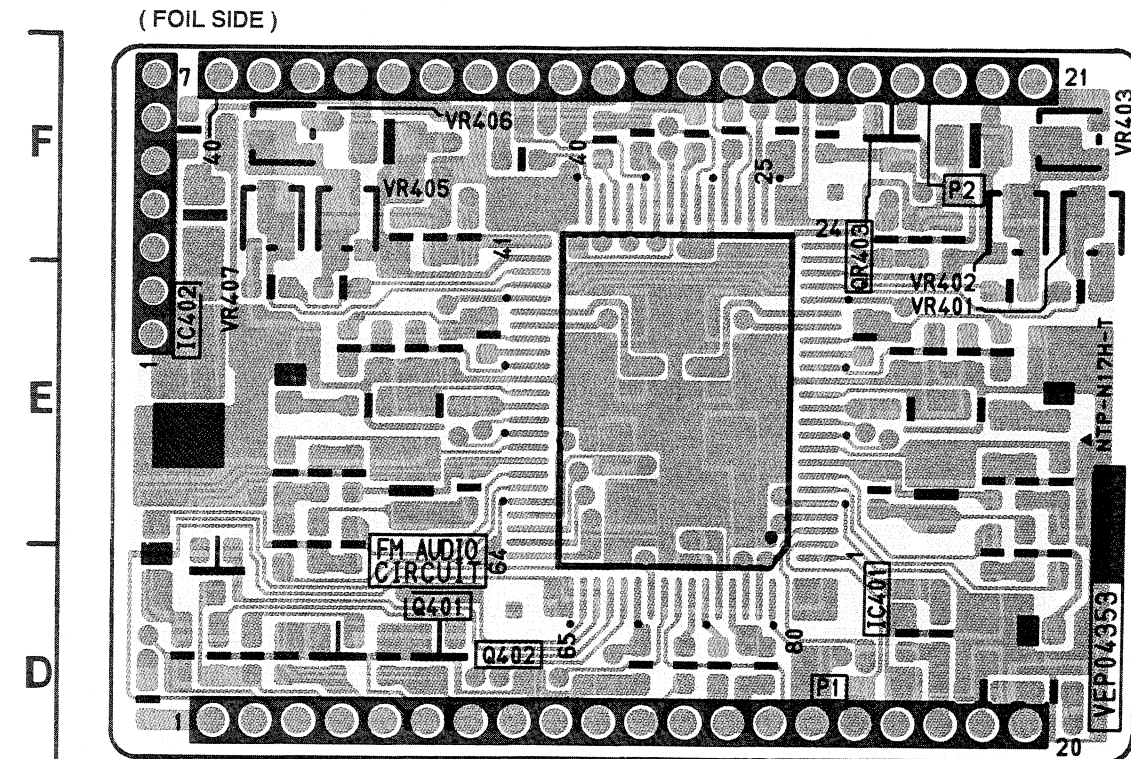
FOIL SIDE

VIDEO 3			
Transistor		Test Point	
Q8001	D-4	TP8001	D-1
Q8002	E-3	TP8002	A-1
Q8003	E-3	TP8003	A-1
Q8004	D-4	TP8004	B-1
Q8005	D-3	TP8005	D-1
Q8006	D-4	TP8006	B-1
Q8007	C-2	TP8007	B-1
Q8008	C-3	TP8008	B-1
Q8009	D-4	TP8009	A-1
Q8010	D-2	TP8001	B-1
Q8012	B-2	Connector	
Q8013	B-2	P8001	C-4
Q8014	B-2		
Q8016	B-3		
Q8017	B-3		
Q8018	C-3		
Q8019	C-3		
Q8020	C-3		
Transistor & Resistor			
QR8001	C-2		
QR8002	C-2		
QR8003	C-2		
QR8004	C-2		
QR8005	C-2		
QR8006	C-3		
Integrated Circuit			
IC8001	D-4		
IC8002	A-2		
IC8005	D-1		
IC8007	C-1		
IC8009	C-1		
IC8012	B-3		

ADDRESS INFORMATION

FM AUDIO PACK C.B.A. (VEP04353B)

HEAD AMP C.B.A. (VEP05162I)



FOIL SIDE

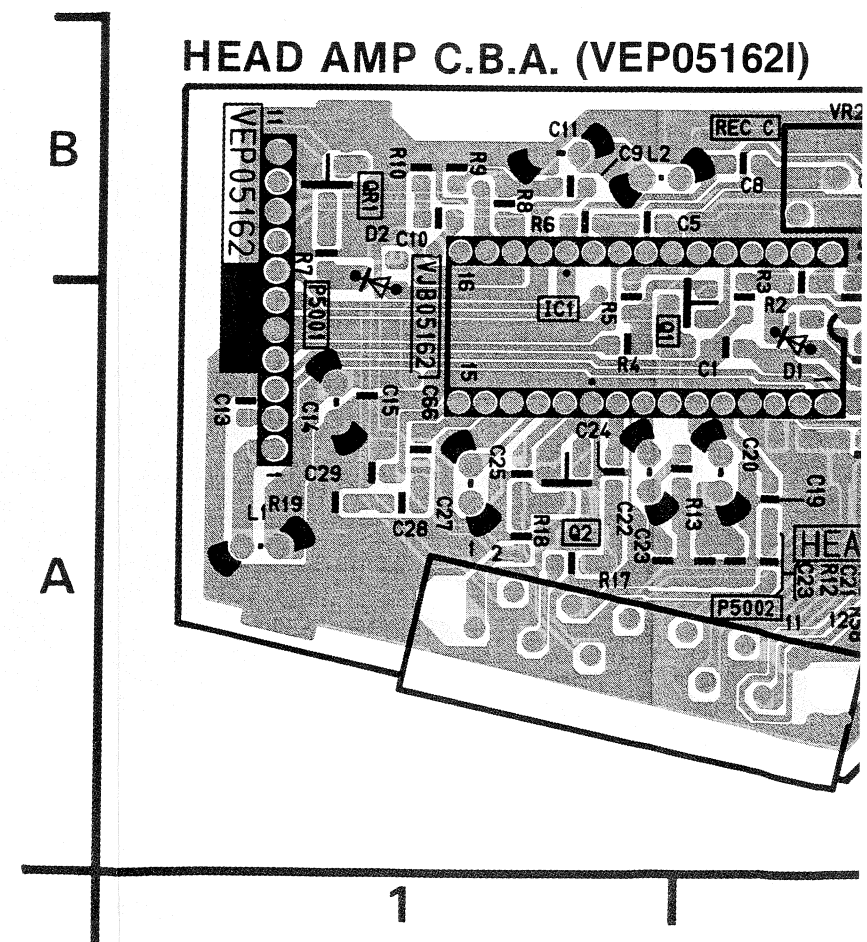
FM AUDIO	
Transistor	
Q401	D-2
Q402	D-2
Transistor & Resistor	
QR403	F-3
Integrated Circuit	
IC402	E-1
Adjustment	
VR401	E-4
VR402	E-4
VR403	F-4
VR405	F-2
VR406	F-2
VR407	E-1

ADDRESS INFORMATION

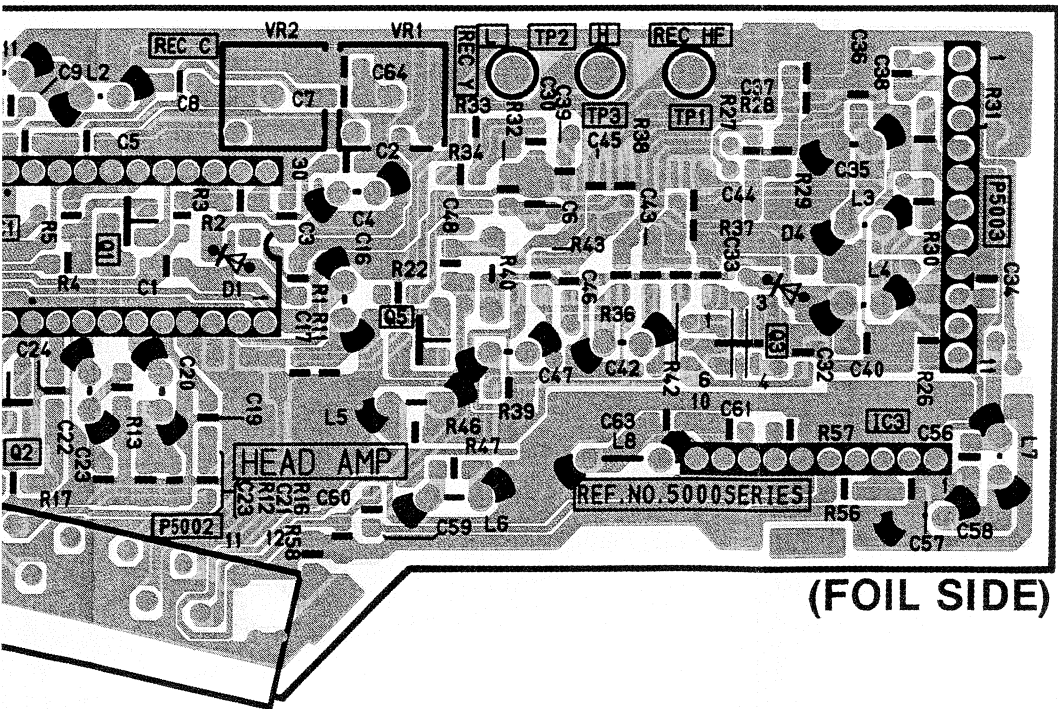
COMPONENT SIDE

FM AUDIO	
Transistor & Resistor	
QR401	C-2
QR404	C-3
Integrated Circuit	
IC402	C-4

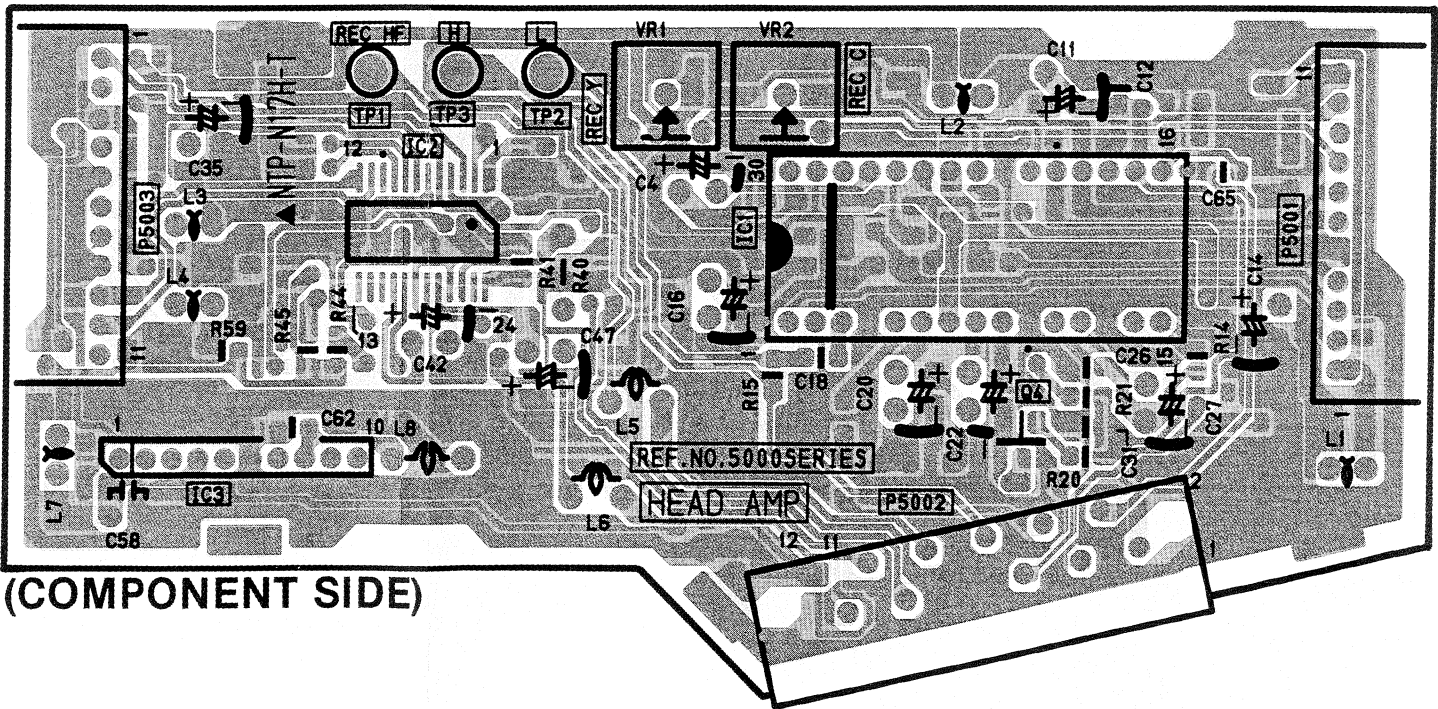
ADDRESS INFORMATION



(VEP05162I)



(FOIL SIDE)

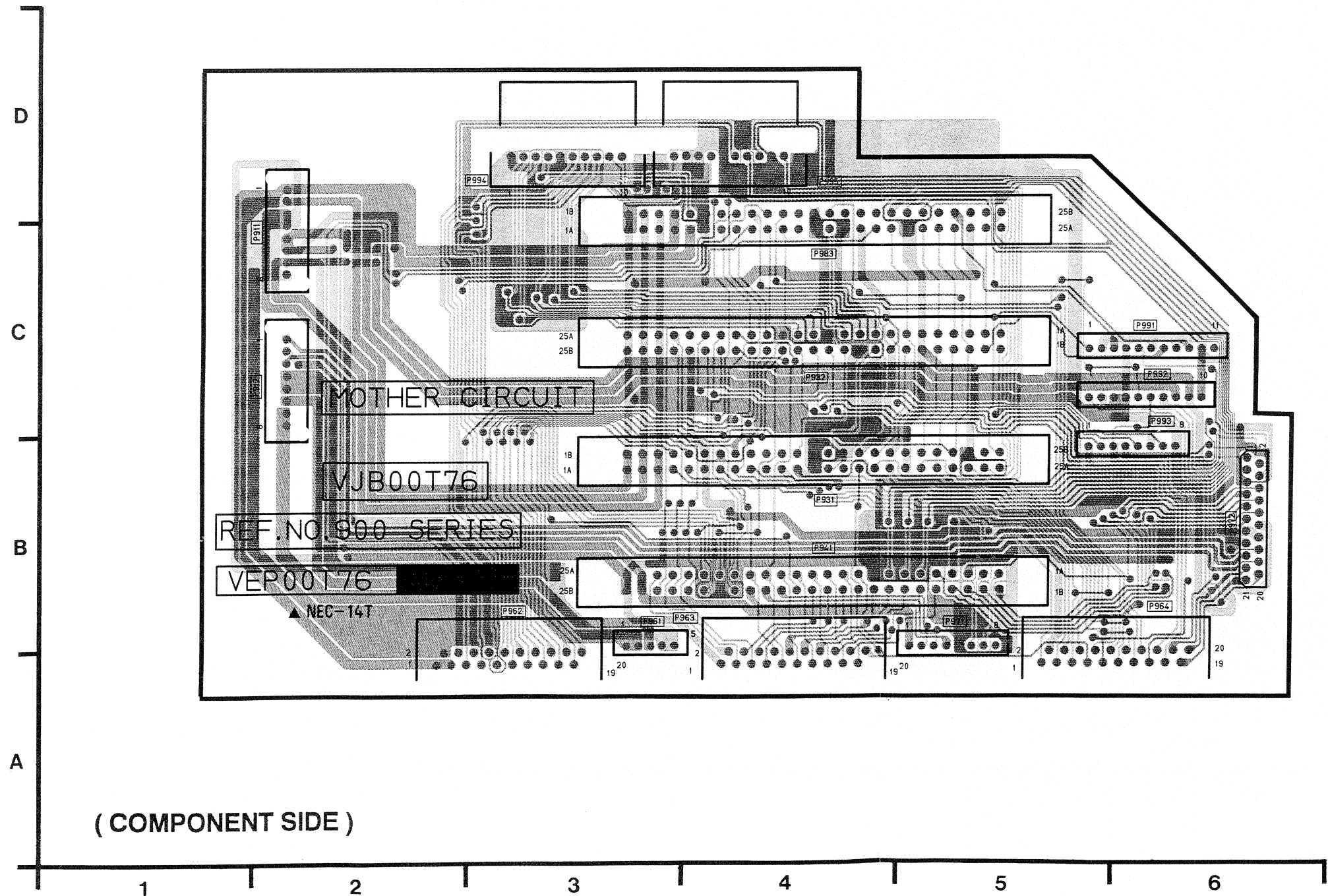


(COMPONENT SIDE)

HEAD AMP C.B.A.		
Transistor		
Q5001	A-1	Ⓟ
Q5002	A-1	Ⓟ
Q5003	A-3	Ⓟ
Q5004	A-5	Ⓢ
Q5005	A-2	Ⓟ
Transistor & Resistor		
QR5001	B-1	Ⓟ
Integrated Circuit		
IC5001	A-1	Ⓟ
IC5001	A-4	Ⓢ
IC5002	B-4	Ⓢ
IC5003	A-3	Ⓟ
IC5003	A-4	Ⓢ
Adjustment		
VR5001	B-2	Ⓟ
VR5001	B-4	Ⓢ
VR5002	B-2	Ⓟ
VR5002	B-4	Ⓢ
Test Point		
TP5001	B-2	Ⓟ
TP5001	B-4	Ⓢ
TP5002	B-2	Ⓟ
TP5002	B-4	Ⓢ
TP5003	B-2	Ⓟ
TP5003	B-4	Ⓢ
Connector		
P5001	A-1	Ⓟ
P5001	A-5	Ⓢ
P5002	A-2	Ⓟ
P5002	A-5	Ⓢ
P5003	A-3	Ⓟ
P5003	A-3	Ⓢ

ADDRESS INFORMATION
Ⓢ... COMPONENT SIDE
Ⓢ... FOIL SIDE

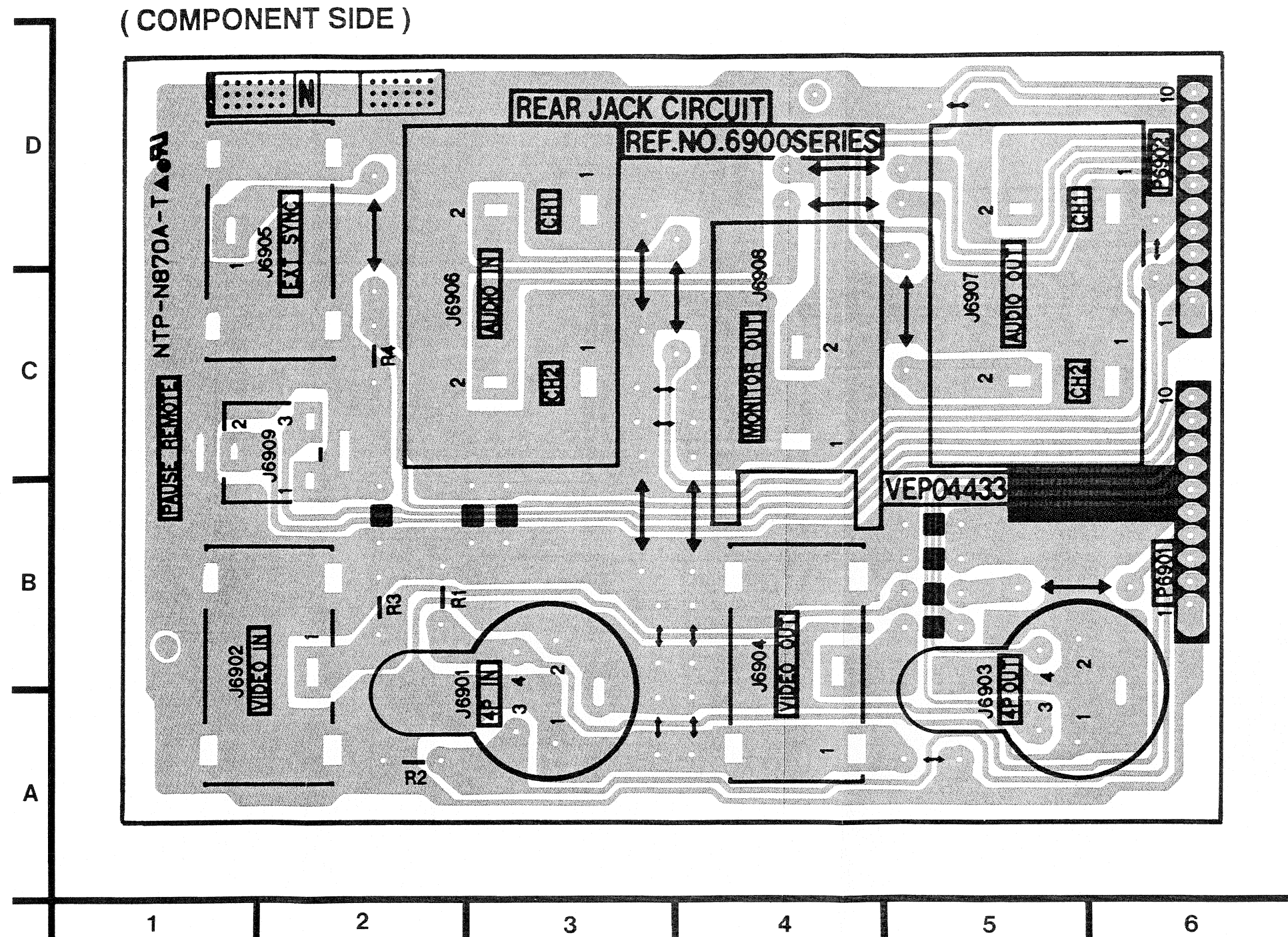
MOTHER C.B.A. (VEP00T76A)



MOTHER	
Connector	
P911	C-2
P912	C-2
P931	B-4
P932	C-4
P941	B-4
P961	B-3
P962	B-3
P963	B-4
P964	B-6
P971	B-5
P972	B-6
P983	C-4
P991	C-6
P992	C-6
P993	C-6
P994	D-3
P995	D-4

ADDRESS INFORMATION

REAR JACK C.B.A. (VEP04433A)



SECTION 8

EXPLODED VIEWS & REPLACEMENT PARTS LISTS

CONTENTS

SERVING FIXTURES & TOOLS LIST	PRT-2
CHASSIS PARTS SECTION	PRT-3
MOVING PARTS SECTION	PRT-5
CASSETTE COMPARTMENT SECTION	PRT-7
CHASSIS & FRAME SECTION	PRT-8
PACKING PARTS SECTION	PRT-10
ELECTRICAL REPLACEMENT PARTS LIST	PRT-11

NOTES

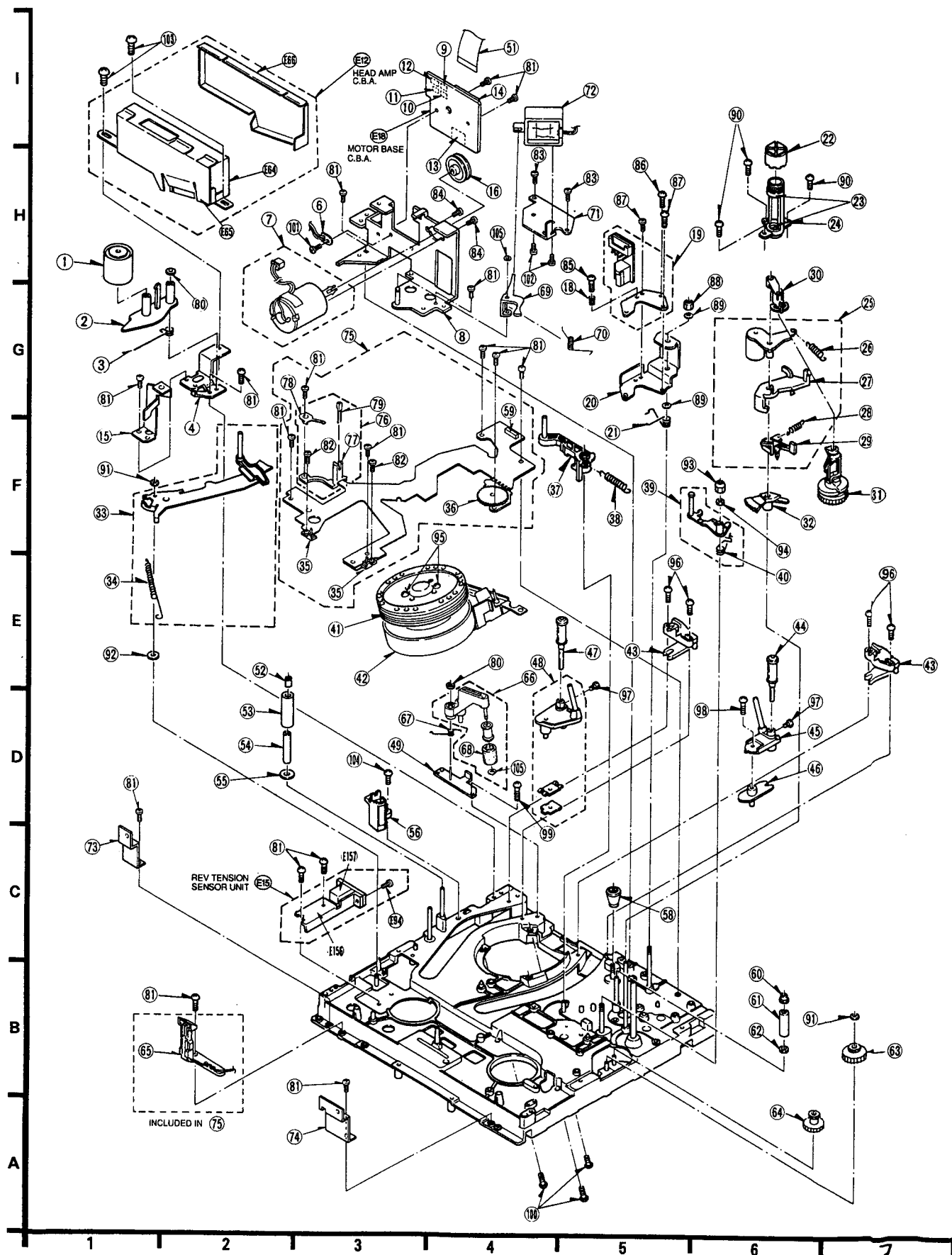
1. ● Be sure to make your orders of replacement parts according to this list.
- "<R>" in Remark column indicates recommended parts.
- "<M>" in Remark column indicates needed in the periodical maintenance.
2. **IMPORTANT SAFETY NOTICE**
 Components identified by "<I>" have special characteristics important for safety.
 When replacing any of these components, use only the original ones.
 Meaning of symbol "<I>" on this parts list is exactly the same as symbol Δ on Schematic and Circuit Board Diagrams.
3. Unless otherwise specified ;
 All resistors are in (Ω), K=1,000 Ω , M=1,000k Ω .
 All capacitors are in (F), U=10⁻⁶ F, P=10⁻¹² F.
4. **ITEM NUMBERS WITH CAPITAL LETTER E**
 Item numbers with capital letter E (Example:E1, E2,...) in Ref.No. column mean that the parts are listed with the E item numbers in the exploded views.
5. The main assembled parts are shown below C.B.A. marked with "■".
6. When ordering parts, use parts No. only from Part No. column.
7. Printed circuit board assembly with mark.(RTL) is no longer available after discontinuation of the product.
8. Abbreviations for parts ;

-- NAME --	-- DESCRIPTION --
C.CAPACITOR	CERAMIC CAPACITOR
C.CAPACITOR CH	CERAMIC CHIP CAPACITOR
E.CAPACITOR	ELECTROLYTIC CAPACITOR
G.CAPACITOR	GLASS CAPACITOR
M.CAPACITOR	MICA CAPACITOR
P.CAPACITOR	PLASTIC FILM CAPACITOR
S.CAPACITOR	SEMI-CONDUCTOR CAPACITOR
T.CAPACITOR	TANTALUM CAPACITOR
TRIMMER	TRIMMER
C.RESISTOR	CARBON RESISTOR
F.RESISTOR	FUSE RESISTOR
M.RESISTOR	METAL OXIDE RESISTOR
M.RESISTOR CH	METAL OXIDE CHIP RESISTOR
S.RESISTOR	SOLID RESISTOR
V.RESISTOR	VARIABLE RESISTOR
W.RESISTOR	WIRE WOUND RESISTOR
COMBI. TR-R	TRANSISTOR-RESISTOR COMBINATION PARTS
COMBI. R-R	RESISTOR-RESISTOR COMBINATION PARTS
COMBI. C-R-L	CAPACITOR-COIL COMBINATION PARTS
C.B.A.	CIRCUIT BOARD ASSEMBLY

SERVICING FIXTURES & TOOLS LIST

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VFM8180HADH	VHS ALIGNMENT TAPE	1			VFK0335	RETAINING RING REMOVER	1	
	VFK0329	POST ADJ. SCREWDRIVER	1				(3mm/4mm)		
	VFK0132	BACK TENSION METER	1	(T2-H7-UM)		VFK0326	HEX. WRENCH SET	1	
		(TENTELOMETER, MADE IN U.S.A.)				VFK0948	CHECK LIGHT	1	
	VFK0191	POST ADJ. PLATE	1			MOR265	MOLYTONE GREASE	1	
	VFK0133	DIAL TORQUE GAUGE	1			VFK0680	S.C.R. GREASE	1	
	VFK0180	PLASTIC CLAMPER ONLY	1			VFK27	HEAD CLEANING STICK	1	
	VFK0134	ADAPTOR FOR VFK0133	1			VFK0344	POST HEIGHT ADJ. FIXTURE	1	
	VFK0190	REEL TABLE HEIGHT GAUGE	1			VFK0269	L TYPE SCREWDRIVER	1	
	VFK0236	TENSION POST ADJ. FIXTURE	1			VFK66	FAN TYPE TENSION GAUGE	1	
	VFK0806	TENSION SENSOR ADJ. FIXTURE	1			VFK0945	EXTENDER BOARD 50P	1	
	VFK0328	H-POSITION ADJ. SCREWDRIVER	1			VFK0828	EXTENDER CODE 8P		
	VFK0330	FINE ADJ. SCREWDRIVER	1			VFK0131	HIGH QUALITY OIL	1	
		(3mm PHI)							

EXPLODED VIEWS ① Chassis Parts Section



Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1-1	VXP1075	IMPEDANCE ROLLER UNIT	1		1-78	WMB2020	EARTH SPRING	1	
1-2	VML2293	IMPEDANCE ROLLER ARM	1		1-79	GL450	LED	1	
1-3	VMB1976	IMPEDANCE SPRING	1		1-80	VMX1079	CUT WASHER	2	
1-4	VMA7982	HEAD AMP ANGLE (L)	1		1-81	XTV26+6F	SCREW	14	
1-6	VEK3185	HUMIDITY RESISTOR UNIT	1	<R>	1-82	XTV2+4F	SCREW	2	
1-7	VEM0360	LOADING MOTOR UNIT	1	<R><R><I>	1-83	XYN26+K5	SCREW	2	
1-8	VXA5151	MOTOR BASE (1) UNIT	1		1-84	XSN3+3.5	SCREW	2	
1-9	VJP1229G	CONNECTOR (2P)	1		1-85	VHD0322	SCREW	1	
1-10	VJP1229T	CONNECTOR (2P)	1		1-86	VHD0089B	SCREW	1	
1-11	VJP1229R	CONNECTOR (2P)	1		1-87	XSN306FZ	SCREW	2	
1-12	VJP1230R	CONNECTOR (3P)	1		1-88	VHN0063	M4 NYLON NUT	1	
1-13	VJP3106B013	CONNECTOR (13P)	1		1-89	XWE4	M4 NYLON WASHER	2	
1-14	VJS1493	CONNECTOR (15P)	1		1-90	VHD0374	SCREW	3	
1-15	VMA8130	IMPEDANCE ROLLER SUPPORT ANGLE	1		1-91	VMX0653	CUT WASHER	2	
1-16	VDP1319	MOTOR PULLEY	1		1-92	XWGV306G	POLLY SLIDER WASHER	1	
1-18	VMB1251	ADJUST SPRING	1		1-93	VHD0045	M3 NYLON NUT	1	
1-19	VED0104	A/C HEAD (1) UNIT	1	<R>	1-94	XWE3VW	M3 WASHER	1	
1-20	VXA3649	A/C HEAD BASE UNIT	1		1-95	VHD0425	SCREW	2	
1-21	VMB1567	A/C HEIGHT SPRING	1		1-96	XTV26+10F	SCREW	4	
1-22	VXQ0006	THRUST SCREW UNIT	1		1-97	VHD0133	SCREW	2	
1-23	VMX1033	OIL SEAL	2		1-98	XYN26+F6FZ	SCREW	1	
1-24	VXD0101	HOUSING UNIT	1		1-99	XTN3+6F	SCREW	1	
1-25	VXL2367	PRESSURE ROLLER UNIT	1	<R>	1-100	VHD0342	SCREW	3	
1-26	VMB1977	PINCH PRESSURE SPRING	1		1-101	XTV2+6J	SCREW	1	
1-27	VXL2368	PINCH PRESSURE ARM	1		1-102	XYN26+C4	SCREW	2	
1-28	VMB1569	PINCH ARM SPRING	1		1-103	XTW3+8TR	SCREW	2	
1-29	VML1874	PINCH LIFT ARM	1		1-105	VMX0653	CUT WASHER	11	
1-30	VMX1353	PINCH CAM ARM	1						
1-31	VDG0577	PINCH CAM	1						
1-32	VDG0651	PINCH SECTOR GEAR	1						
1-33	VXL2089	TENSION ARM UNIT	1						
1-34	VMB1975	TENSION SPRING	1						
1-35	VSP0293	CASSETTE DETECT SW	2						
1-36	VSS0257	MODE SWITCH	1	<R>					
1-37	VXL1857	SUB LOADING ARM (1) UNIT	1						
1-38	VMB1566	SUB POST SPRING	1						
1-39	VXL2074	P5 ARM UNIT	1						
1-40	VMB1554	P5 SPRING	1						
1-41	VEH0437	UPPER CYLINDER UNIT	1	<R>					
1-42	VEG0909	LOWER CYLINDER UNIT	1	<R>					
1-43	VMD0910	POST STOPPER	2						
1-44	VXP1094	ROLLER POST (T) UNIT	1						
1-45	VXA3713	INCLINED BASE (T)(1) UNIT	1						
1-46	VXA2687	INCLINED ADJUSTMENT PLATE U	1						
1-47	VXP1093	ROLLER POST (S) UNIT	1						
1-48	VXA3249KIT	INCLINED BASE (S)	1						
1-49	VXA3980	HEAD CLEANING PLATE	1						
1-51	VEE8714	FLEXIBLE CABLE	1						
1-52	VMX1088	SUPPLY UPPER LIMITER	1						
1-53	VDP1304	SUPPLY ROLLER	1						
1-54	VMX1581	P1 COLLAR	1						
1-55	VMX1533	SUPPLY LOWER LIMITER	1						
1-56	VBS0038	FE HEAD	1						
1-58	VHN0110	ADJUST NUT	1						
1-59	VJS2964A013	CONNECTOR (15P)	1						
1-60	VMX1544	P4 UPPER LIMITER	1						
1-61	VMX1568	P4 SLEEVE	1						
1-62	VMX1534	P4 LOWER LIMITER	1						
1-63	VDG0664	CONNECTION GEAR	1						
1-64	VDG0483	PINCH SPEED DOWN GEAR	1						
1-65	VES0489	SAFETY SWITCH	1						
1-66	VXL2263	HEAD CLEANING UNIT	1	<R>					
1-67	VMB2532	CLEANING SPRING	1						
1-68	VMT0321	HEAD CLEANING PAD	1						
1-69	VML2845	CAM LEVER	1						
1-70	VMB2672	CAM LEVER SPRING	1						
1-71	VMA8977	SOLENOID BASE	1						
1-72	VSJ0111	PINCH SOLENOID	1						
1-73	VMA6895	MOUNT PLATE (L)	1						
1-74	VMA6896	MOUNT PLATE (R)	1						
1-75	VXA5166	BIND FLEXIBLE UNIT	1						
1-76	VXA3520	LED UNIT	1						
1-77	VMD0911	LED HOLDER	1						

Exploded view diagram of a mechanical assembly, likely a washing machine drum. The diagram shows various components numbered 1 through 78. The assembly is organized into a grid with letters A through I on the left and numbers 1 through 7 at the bottom.

Key components and their locations:

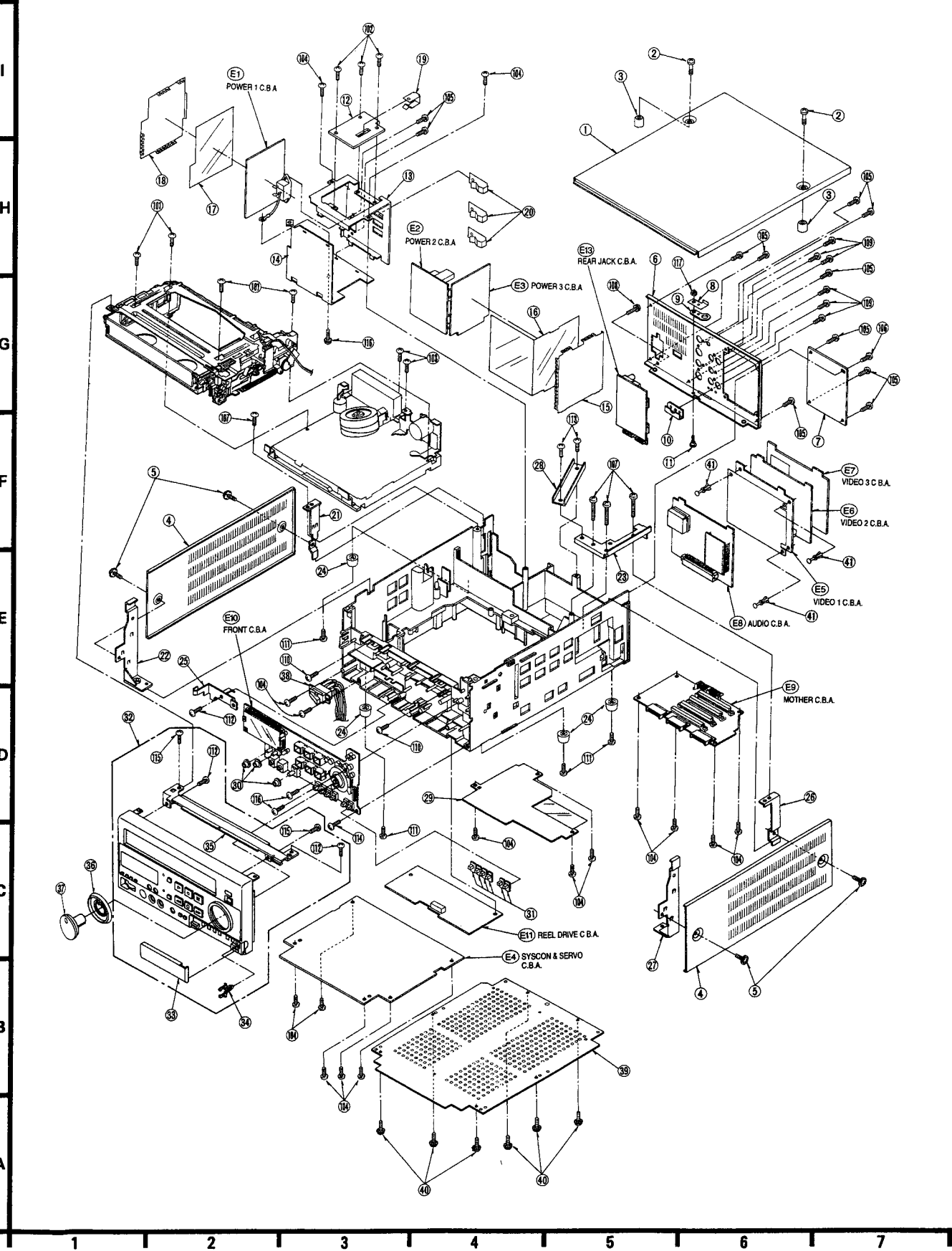
- Top Section (I, H, G):** Components 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78.
- Bottom Section (A):** Components 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78.

The diagram includes a 'TENSION SENSOR UNIT' at the bottom right, connected to a cable. The assembly is shown in an exploded view, indicating the relative positions and assembly sequence of the components.

PRT — 6

[illegible]

④ Chassis Frame Section



PRT — 8

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
4-1	VGM1106	TOP PLATE	1		5-1	VQT5833	OPERATING INSTRUCTIONS	1	
4-2	VHD0222	SCREW	2		5-2	VPN3813	CUSHION (REAR)	1	
4-3	VNX2248	TOP PANEL SPACER	2		5-3	VPN3814	CUSHION (FRONT)	1	
4-4	VGM1055	SIDE PLATE	2		5-4	VJA0746	POWER CORD	1	<1> ROUND PIN
4-5	VHD0305	SCREW	4		5-4	VJA0738	POWER CORD	1	<1> SQUARE PIN
4-6	VXA5159	JACK PANEL	1		5-5	VPF0136	POWER CORD SHEET	1	
4-7	VMP2376	RS-232C COVER	1		5-6	VP67276	PACKING CASE	1	
4-8	VMC0993	HOCK SPRING	1						
4-9	VGK2091	HOCK	1						
4-10	VMP4250	SUPPORT ANGLE	1						
4-11	VHD0052	SCREW	1						
4-13	VSC4009	HEAT SINK (A)	1						
4-14	VSC4005	HEAT SINK (B)	1						
4-15	VSC4006	POWER SHIELD COVER (A)	1						
4-16	VNZ2247	SHIELD SHEET (B)	1						
4-17	VNZ2246	SHIELD SHEET (A)	1						
4-18	VSC4007	POWER SHIELD COVER (B)	1						
4-19	VMC0981	TR. SUPPORT SPRING (1)	1						
4-20	VMC0357	TR. SUPPORT SPRINT (2)	3						
4-21	VMP4254	SIDE PLATE ANGLE (REAR L)	1						
4-22	VXA5157	SIDE PLATE ANGLE (FRONT L)	1						
4-23	VMP4253	TOP PLATE ANGLE	1						
4-24	VKA0117	FOOT	4						
4-25	VMC1001	EARTH SPRING	1						
4-26	VMP4255	SIDE PLATE ANGLE (REAR R)	1						
4-27	VXA5158	SIDE PLATE ANGLE (FRONT R)	1						
4-28	VXA5160	P.C.B. SUPPORT ANGLE	1						
4-29	VMP3842	SHIELD PLATE	1						
4-30	VGU6509	VOLUME KNOB	3						
4-31	VGU6516	SLIDE KNOB	6						
4-32	VYP5452	FRONT PANEL	1						
4-33	VKN1848	OPERATION DOOR	1						
4-34	VGQ1442	PEACE	1						
4-35	VMP4247	LEINFORCE ANGLE	1						
4-36	VGU6554	SHUTTLE RING	1						
4-37	VXU1139	JOG DIAL	1						
4-38	VES0708	POWER SWITCH	1						
4-39	VKU0394	BOTTOM PLATE	1						
4-40	VHD0059	SCREW	6						
4-101	XTV26+8FR	SCREW	4						
4-103	XTW3+8TFR	SCREW	3						
4-104	XTV3+10JFR	SCREW	18						
4-105	XTB3+8FFZ	SCREW	9						
4-106	XTB3+12FFZ	SCREW	1						
4-107	XTV3+10G	SCREW	4						
4-108	XTB4+10FFN	SCREW	1						
4-109	XTV3+8GFZ	SCREW	5						
4-110	XTV4+8F	SCREW	2						
4-111	XTV3+16G	SCREW	4						
4-112	XTV3+8G	SCREW	3						
4-113	XTV3+8FFR	SCREW	2						
4-114	XTV4+10JFR	SCREW	1						
4-115	XTW3+10LR	SCREW	2						

PRT — 9

[illegible]

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
*****	VEP01598A	P.C. BOARD W/COMPONENT POWER (1)		
C1001	ECQU2A224MN	P.CAPACITOR 100V 0.22U	1	<I>
C1002-05	VCK0041	C.CAPACITOR	4	<I>
C1012	ECEC2GC221DB	E.CAPACITOR 400V 220U	1	
C1013	ECQE6473KF	P.CAPACITOR	1	
C1014	ECKD3D151KB	C.CAPACITOR 2KV 150P	1	
C1015	ECA1VXLV470	E.CAPACITOR 35V 47U	1	
C1017	ECKF1H102KB	C.CAPACITOR 50V 100P	1	
C1018	ECA0GXLV331	E.CAPACITOR 4V 330U	1	
C1038	ECKF1H271KB	C.CAPACITOR 50V 270P	1	
D1001	D3SBA60	DIODE	1	<R><I>
D1005	MA723	DIODE	1	<R>
D1014	AP01C	DIODE	1	<R>
D1015	VSD0001	DIODE	1	<R>
D1016	MA4240-H	DIODE	1	<R>
IC1001	STRM6545LF	IC	1	<R><I>
L1001	ELF18D602	COIL	1	<I>
L1003	VLP0074	COIL	1	
L1009	EXCELSA35	COIL	1	
P1001	VJP2639	CONNECTOR (MALE)	1	
R1001	ERF5TK2R2	W.RESISTOR 5W 2.2	1	<I>
R1002-04	ERG1SJ473	M.RESISTOR 1W 47K	3	
R1005	ERG3SJ393	M.RESISTOR 3W 39K	1	
R1006	ERDS2FJ221	C.RESISTOR 1/4W 220	1	
R1007	ERDS2FJ271	C.RESISTOR 1/4W 270	1	
R1008	ERDS2FJ471	C.RESISTOR 1/4W 470	1	
R1009	ERW1PKR56	W.RESISTOR 1W 0.56	1	
R1010	ERDS2FJ152	C.RESISTOR 1/4W 1.5K	1	
R1011	ERDS2FJ101	C.RESISTOR 1/4W 100	1	
R1012	ERDS2FJ103	C.RESISTOR 1/4W 10K	1	
R1019	ERDS2FJ224	C.RESISTOR 1/4W 220K	1	
R1020	ERDS1TJ395	C.RESISTOR 1/2W 3.9M	1	
R1021	ERDS1TJ475	C.RESISTOR 1/2W 4.7M	1	
VMZ0954		MISCELLANEOUS CAPACITOR COVER	4	
VMZ1305		MISCELLANEOUS CAPACITOR COVER	1	
T1001	VLTO731	TRANSFORMER	1	<I>

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
*****	VEP01599A	P.C. BOARD W/COMPONENT POWER (2)		
C1019	ECA1AFZ331	E.CAPACITOR 10V 330U	1	
C1020	ECEA1AGE471	E.CAPACITOR 10V 470U	1	
C1021	ECQW1H104JZ	P.CAPACITOR 50V 0.1U	1	
C1022-25	ECKF1H103ZF	C.CAPACITOR 50V 1000P	4	
C1026	ECEA1HFS101	E.CAPACITOR 50V 100U	1	
C1027	ECA1VFQ681	E.CAPACITOR 35V 680U	1	
C1028	ECEA1VGE471	E.CAPACITOR 35V 470U	1	
C1029	ECEA1CGE221	E.CAPACITOR 16V 220U	1	
C1030	ECKD2H101KB	C.CAPACITOR 500V 100P	1	
C1031	ECA1EFZ471	E.CAPACITOR 25V 470U	1	
C1032	ECEA1EGE471	E.CAPACITOR 25V 470U	1	
C1033	ECKD2H101KB	C.CAPACITOR 500V 100P	1	
C1034	ECA1AFZ122	E.CAPACITOR 10V 1.2U	1	
C1035	ECKF1H103ZF	C.CAPACITOR 50V 1000P	1	
C1036	ECEA1AGE221	E.CAPACITOR 10V 220U	1	
C1037	ECKD2H221KB	C.CAPACITOR 500V 220P	1	
D1006	AK04	DIODE	1	<R>
D1007	VSD0001	DIODE	1	<R>
D1008	RL4Z	DIODE	1	<R>
D1010	FMLG12SP	DIODE	1	<R>
D1011	FMB-G14L	DIODE	1	<R>
D1012	UPC1093J	DIODE	1	<R>
D1017	RL4Z	DIODE	1	<R>
IC1002	SI3120CA	IC	1	<R>
L1004	VLQ0410	COIL	1	
L1005,06	VLQ0592	COIL	2	
L1007	VLQLO6F101J	COIL 100UH	1	
L1008	VLP0083	COIL	1	
P1002,03	VJP3324	CONNECTOR (MALE)	2	
Q1001	PC111LY1	TRANSISTOR	1	<R><I>
R1013	ERDS2TJ271	C.RESISTOR 1/4W 270	1	
R1014	ERDS2TJ561	C.RESISTOR 1/4W 560	1	
R1015	EROS2CKG1801	M.RESISTOR 1/4W 1.8K	1	
R1016	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
R1017	EROS2CKG1301	M.RESISTOR 1/4W 1.3K	1	
R1018	ERQ12HJ4R7	F.RESISTOR 1/2W 4.7	1	<I>

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
*****	VEP03B32A	P.C.BOARD W/COMPONENT			C3076	ECEV0JV101	E.CAPACITOR 6.3V 100U	1	
		VIDEO (1)			C3077	ECEV1HV010	E.CAPACITOR 50V 1U	1	
	VEP00R78A	P.C.BOARD W/COMPONENT			C3090	ECEV0JV101	E.CAPACITOR 6.3V 100U	1	
		CCD PACK			C3091	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1	
					C3092	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1	
					C3093	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
					C3094	ECUM1H120JCN	C.CAPACITOR CH 50V 12P	1	
					C3095	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
					C3096	ECUM1H181JCN	C.CAPACITOR CH 50V 180P	1	
					C3097	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	1	
					C3098	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
					C3099	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	1	
		CAPACITORS			C3100	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C1	ECEA1CKS100	E.CAPACITOR 16V 10U	1		C3101, 02	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	2	
C2	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3801	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3	ECEA1CKS100	E.CAPACITOR 16V 10U	1		C3802	ECEV0JV470	E.CAPACITOR 6.3V 47U	1	
C4-C6	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3		C3803	ECUM1E683KBN	C.CAPACITOR CH 25V 0.068U	1	
C7	ECEA1HKS4R7	E.CAPACITOR 50V 4.7U	1		C3804	ECUM1H121JCN	C.CAPACITOR CH 50V 120P	1	
C8	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1		C3805, 06	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	2	
C9	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3808	ECUM1H331JCN	C.CAPACITOR CH 50V 330P	1	
C10	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3809	ECUM1H121JCN	C.CAPACITOR CH 50V 120P	1	
C11	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1		C3810	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C12	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1		C3812	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3001	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1		C3813	ECEV0JV101	E.CAPACITOR 6.3V 100U	1	
C3002	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1		C3814	ECEV1EV4R7	E.CAPACITOR 25V 4.7U	1	
C3003	ECEV1HW4R7	E.CAPACITOR 50V 4.7U	1		C3817	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3004, 05	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2		C3818	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1	
C3006	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1		C3819	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3007	ECEV1CV470	E.CAPACITOR 16V 47U	1		C3820	ECEV0JV470	E.CAPACITOR 6.3V 47U	1	
C3008	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3821	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3009	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1		C3824	ECEV1EV4R7	E.CAPACITOR 25V 4.7U	1	
C3010	ECEV1EN4R7Q	E.CAPACITOR 25V 4.7U	1		C3830	ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	1	
C3011, 12	ECEV1CV100	E.CAPACITOR 16V 10U	2		C3831	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3013	ECEV1CV220	E.CAPACITOR 16V 22U	1		C3832, 33	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C3014	ECEV1EV4R7	E.CAPACITOR 25V 4.7U	1		C3834	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
C3015	ECEV0JV101	E.CAPACITOR 6.3V 100U	1		C3835	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
C3016	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3837	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C3017	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1		C3838	ECUM1C474ZFN	C.CAPACITOR CH 16V 0.47U	1	
C3018	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3839, 40	ECUM1C105ZFN	C.CAPACITOR CH 16V 1U	2	
C3020	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1		C3841, 42	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C3024	ECEV0JV101	E.CAPACITOR 6.3V 100U	1		C3843	ECEV1HVR470	E.CAPACITOR 50V 0.47U	1	
C3025	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3844	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C3026	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1		C3845	ECEV0JV470	E.CAPACITOR 6.3V 47U	1	
C3027	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C3847	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C3028	ECUM1H121JCN	C.CAPACITOR CH 50V 120P	1		C3848	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C3029, 30	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2		C3850	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
C3031	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1						
C3032	ECUM1H391JCN	C.CAPACITOR CH 50V 390P	1						
C3033	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1						
C3034	ECEV1HV010	E.CAPACITOR 50V 1U	1		D1	MA3091-M	DIODE	1	<R>
C3035, 36	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2		D3001, 02	MA151K	DIODE	2	<R>
C3037	ECEV0JV101	E.CAPACITOR 6.3V 100U	1		D3005-08	MA151K	DIODE	4	<R>
C3038	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		D3801	MA153	DIODE	1	<R>
C3039	ECUM1H391JCN	C.CAPACITOR CH 50V 390P	1		D3802	MA151K	DIODE	1	<R>
C3040	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	1						
C3041	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1						
C3042	ECUM1E104KBN	C.CAPACITOR CH 25V 0.1U	1						
C3043	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		DL3801	VLD0147	DELAY	1	
C3047	ECEV0JV101	E.CAPACITOR 6.3V 100U	1		DL3803	VLD0089	DELAY	1	
C3048	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1						
C3049	ECUM1H181JCN	C.CAPACITOR CH 50V 180P	1						
C3050	ECUM1H080DCN	C.CAPACITOR CH 50V 8P	1						
C3051	ECUM1H681JCN	C.CAPACITOR CH 50V 680P	1		FL3001	VLF0729	FILTER	1	
C3052	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1		FL3002	VLF0639	FILTER	1	
C3053	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		FL3003	ELB4M022	FILTER	1	
C3055-59	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	5		FL3004	ELB5A066	FILTER	1	
C3060	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1		FL3005	ELB4K114	FILTER	1	
C3061	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		FL3006	ELB4R031	FILTER	1	
C3062, 63	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	2		FL3007	ELB4K114	FILTER	1	
C3064	ECUM1H080DCN	C.CAPACITOR CH 50V 8P	1		FL3801	VLF0996	FILTER	1	
C3065	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		FL3802	VLF0299	FILTER	1	
C3066	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1		FL3803	VLF0965	FILTER	1	
C3069-72	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4						
C3073, 74	ECEV1CV470	E.CAPACITOR 16V 47U	2						
C3075	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1						

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R3063	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1		R3840	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1	
R3064	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		R3841	ERJ6GEYJ393	M.RESISTOR CH1/16W 39K	1	
R3065	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1		R3842	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R3066	ERJ6GEYJ182	M.RESISTOR CH1/16W 1.8K	1		R3843	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3067	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1		R3844	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1	
R3068	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1		R3851	ERJ6GEYJ330	M.RESISTOR CH1/16W 33	1	
R3069	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1		R3852	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3070	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1		R3853	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3071	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		R3854, 55	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	2	
R3072, 73	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	2		R3856, 57	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	2	
R3075	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1		R3858, 59	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	2	
R3076	ERJ6GEYJ123	M.RESISTOR CH1/16W 12K	1		R3860	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1	
R3077	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1		R3861-63	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	3	
R3078	ERJ6GEYJ183	M.RESISTOR CH1/16W 18K	1		R3864	ERJ6GEYJ470	M.RESISTOR CH1/16W 47	1	
R3079	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1		R3865	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R3080	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1		R3866, 67	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3081, 82	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	2		R3868	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1	
R3083	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1		R3869	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R3084	ERJ6GEYJ471	M.RESISTOR CH1/16W 470	1		R3878, 79	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2	
R3085	ERJ6GEYJ182	M.RESISTOR CH1/16W 1.8K	1		R3880	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
R3086	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1						
R3087	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	1						
R3088	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1						
R3089	ERJ6GEYJ391	M.RESISTOR CH1/16W 390	1						
R3090	ERJ6GEYJ122	M.RESISTOR CH1/16W 1.2K	1		VR3001	EVM7JGA00B13	V.RESISTOR	1	
R3091	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1		VR3002	EVM7DGA00B52	V.RESISTOR 500	1	
R3092	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1		VR3003	EVM7DGA00B53	V.RESISTOR 5K	1	
R3093	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1		VR3004	EVM7DGA00B14	V.RESISTOR 10K	1	
R3094	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1		VR3005	EVM7JGA00B24	V.RESISTOR	1	
R3103	ERJ6GEYJ271	M.RESISTOR CH1/16W 270	1		VR3006	EVM7DGA00B54	V.RESISTOR	1	
R3104	ERJ6GEYJ183	M.RESISTOR CH1/16W 18K	1		VR3007	EVM7JGA00B14	V.RESISTOR	1	
R3105	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1		VR3008	EVM7DGA00B13	V.RESISTOR 1K	1	
R3106	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1		VR3009	EVM7DGA00B52	V.RESISTOR 500	1	
R3107	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		VR3803	EVM7JGA00B13	V.RESISTOR	1	
R3108	ERJ6GEYJ162	M.RESISTOR CH1/16W 1.6K	1		VR3806	EVM7JGA00B13	V.RESISTOR	1	
R3109	ERJ6GEYJ681	M.RESISTOR CH1/16W 680	1						
R3110	ERJ6GEYJ221	M.RESISTOR CH1/16W 220	1						
R3113	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1		X1	VSX0316	CRYSTAL OSCILLATOR	1	<R>
R3115, 16	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	2		X3801	VSX0162	CRYSTAL OSCILLATOR	1	<R>
R3117	ERJ6GEYJ152	M.RESISTOR CH1/16W 1.5K	1						

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Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C4004	ECUX1C104ZV	C.CAPACITOR 16V	1	
C4005	ECEA1CU471	E.CAPACITOR 16V 470U	1	
C4006	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4007	ECEVOJV101	E.CAPACITOR 6.3V 100U	1	
C4008	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4009, 10	ECEV1CV100	E.CAPACITOR 16V 10U	2	
C4011	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4027	ECEV1EV330	E.CAPACITOR 25V 33U	1	
C4028	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4029	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4030	ECHU1C183JA	P.CAPACITOR 0.018U	1	
C4031	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4032	ECHU1C183JA	P.CAPACITOR 0.018U	1	
C4033, 34	ECHU1C472JA	P.CAPACITOR 0.47U	2	
C4035	ECHU1C104J	P.CAPACITOR 0.001U	1	
C4036	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4037	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4038	ECST1CC106Z	T.CAPACITOR 16V	1	
C4039	ECEVOJV101	E.CAPACITOR 6.3V 100U	1	
C4040	ECHU1C223JA	P.CAPACITOR 0.022U	1	
C4041	ECHU1C182JA	P.CAPACITOR 0.18U	1	
C4042	ECHU1C153JA	P.CAPACITOR 0.015U	1	
C4043	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4044	ECEV1EV330	E.CAPACITOR 25V 33U	1	
C4045	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4046	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4047, 48	ECHU1C183JA	P.CAPACITOR 0.018U	2	
C4049	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4050	ECHU1C104J	P.CAPACITOR 0.001U	1	
C4051	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4052	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4053	ECST1CC106Z	T.CAPACITOR 16V	1	
C4054	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4055	ECEV1HV010	E.CAPACITOR 50V 1U	1	
C4056	ECHU1C103JA	P.CAPACITOR 0.01U	1	
C4057	ECEVOJV101	E.CAPACITOR 6.3V 100U	1	
C4058	ECHU1C223JA	P.CAPACITOR 0.022U	1	
C4059	ECHU1C182JA	P.CAPACITOR 0.18U	1	
C4060	ECHU1C153JA	P.CAPACITOR 0.015U	1	
C4061	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4062-67	ECST1CC106Z	T.CAPACITOR 16V	6	
C4068	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4069	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4070	ECEV1HNR47Q	E.CAPACITOR 50V 0.47U	1	
C4071	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4072	ECQB1H332JF	P.CAPACITOR 50V 3300P	1	
C4073	ECQB1H682JF	P.CAPACITOR 50V 6800P	1	
C4074	ECQF6182KZ	P.CAPACITOR	1	
C4075, 76	ECCD2H151J	C.CAPACITOR 500V 150P	2	
C4077-80	ECQB1H473JF	P.CAPACITOR 50V 0.047U	4	
C4081	ECHU1C103JA	P.CAPACITOR 0.01U	1	
C4082	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4083	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4084, 85	ECST1CC106Z	T.CAPACITOR 16V	2	
C4086	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4087, 88	ECEV1CV100	E.CAPACITOR 16V 10U	2	
C4089, 90	ECEV1EV4R7	E.CAPACITOR 25V 4.7U	2	
C4501-03	ECUX1H103ZV	C.CAPACITOR 50V	3	
C4504	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4505	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4506	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4507	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4508, 09	ECST1CC106Z	T.CAPACITOR 16V	2	
C4510	ECEV1CV220	E.CAPACITOR 16V 22U	1	
C4511	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4512	ECEVOJV101	E.CAPACITOR 6.3V 100U	1	
C4513	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4515, 16	ECEV1HV010	E.CAPACITOR 50V 1U	2	
C4517	ECEVOJV101	E.CAPACITOR 6.3V 100U	1	
C4518	ECEV1CV470	E.CAPACITOR 16V 47U	1	
C4519	ECQB1H823JF	P.CAPACITOR 50V 0.082U	1	
C4520	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4521	ECEV1EV330	E.CAPACITOR 25V 33U	1	
C4522	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4523	ECST1CC106Z	T.CAPACITOR 16V	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C4524	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4525-27	ECST1CC106Z	T.CAPACITOR 16V	3	
C4528	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4529	ECST1CC106Z	T.CAPACITOR 16V	1	
C4530	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4531, 32	ECEV1CV100	E.CAPACITOR 16V 10U	2	
C4533, 34	ECUX1C104ZV	C.CAPACITOR 16V	2	
C4535	ECST1CC106Z	T.CAPACITOR 16V	1	
C4536-38	ECEV1CV100	E.CAPACITOR 16V 10U	3	
C4539	ECST1CC106Z	T.CAPACITOR 16V	1	
C4540	ECEV1CV100	E.CAPACITOR 16V 10U	1	
C4541	ECUX1H103ZV	C.CAPACITOR 50V	1	
C4543	ECEV1CV470	E.CAPACITOR 16V 47U	1	
D401	MA720	DIODE	1	<R>
D4001	MA3056-M	DIODE	1	<R>
D4002	MA151K	DIODE	1	<R>
D4005, 06	MA151K	DIODE	2	<R>
D4007	MA151MK	DIODE	1	<R>
D4008	MA151WA	DIODE	1	<R>
D4009, 10	MA151K	DIODE	2	<R>
D4501	MA153	DIODE	1	<R>
FL4001, 02	VLFO402	FILTER	2	
FL4501	VLFO697	FILTER	1	
IC401	BA7705K1	IC	1	<R>
IC4001	M52055FP	IC	1	<R>
IC4002, 03	LA7296	IC	2	<R>
IC4006	NJM4558M	IC	1	<R>
IC4501	MC14053BF	IC	1	<R>
IC4502, 03	NJM4558M	IC	2	<R>
IC4504	UPC78N05H	IC	1	<R>
IC4505	VEP04353B	P.C. BOARD W/COMPONENT	1	<R>
IC4506	AN3912	IC	1	<R>
IC4507	MC14053BF	IC	1	<R>
IC4508	NJM4558M	IC	1	<R>
IC4509	NJM4565MD	IC	1	<R>
IC4510	BA6138	IC	1	<R>
IC4511	MC14066BF	IC	1	<R>
L401	VLQ0163J101	COIL 100UH	1	
L403	VLQ0163J101	COIL 100UH	1	
L4001	VLQEL07F153J	COIL 15UH	1	
L4004	VLQEL07F153J	COIL 15UH	1	
L4007	VLQ24F102K25	COIL	1	
L4501	VLQ0163J101	COIL 100UH	1	
P1, P2	VJR0797	CONNECTOR	2	
P4001	VJP1230R	CONNECTOR (MALE)	1	
P4002	VJP1230T	CONNECTOR (MALE)	1	
P4003	VJP1231T	CONNECTOR (MALE)	1	
P4501	VJP3176B050	CONNECTOR (MALE)	1	
P4502	VJP3079	CONNECTOR (MALE)	1	
Q401, 02	2SD1328-R	TRANSISTOR	2	<R>
Q4001	MSD602-R	TRANSISTOR	1	<R>
Q4007, 08	MSD601-R	TRANSISTOR	2	<R>

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q4009, 10	2SB792-R	TRANSISTOR	2	<R>	R441	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1	
Q4011	MSB710-R	TRANSISTOR	1	<R>	R442, 43	ERJ6GEYJ182	M.RESISTOR CH1/16W 1.8K	2	
Q4012	2SD973A-R	TRANSISTOR	1	<R>	R4001-03	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	3	
Q4013, 14	2SB710A-R	TRANSISTOR	2	<R>	R4004	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1	
Q4015-18	2SD814-R	TRANSISTOR	4	<R>	R4005	ERJ3GEYJ821	M.RESISTOR CH 3W 820	1	
Q4019-22	2SD1938	TRANSISTOR	4	<R>	R4006, 07	ERJ3GEYJ682	M.RESISTOR CH 3W 6.8K	2	
Q4501	MSB710-R	TRANSISTOR	1	<R>	R4008, 09	ERJ3GEYJ123	M.RESISTOR CH 3W 12K	2	
Q4502	MSB709-R	TRANSISTOR	1	<R>	R4019, 20	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	2	
Q4503	MSD602-R	TRANSISTOR	1	<R>	R4051	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1	
Q4504, 05	MSD601-R	TRANSISTOR	2	<R>	R4052	VRE0034E123	M.RESISTOR CH 1/10W 12K	1	
Q4506-10	2SD1328-R	TRANSISTOR	5	<R>	R4053	ERJ3GEYJ101	M.RESISTOR CH 3W 100	1	
					R4054	ERJ3GEYJ181	M.RESISTOR CH 3W 180	1	
					R4055	ERJ3GEYJ222	M.RESISTOR CH 3W 2.2K	1	
					R4056, 57	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	2	
QR401	UN2113	TRANSISTOR-RESISTOR	1	<R>	R4058	ERJ3GEYJ564	M.RESISTOR CH 3W 560K	1	
QR403	UN2213	TRANSISTOR-RESISTOR	1	<R>	R4059	ERJ3GEYJ331	M.RESISTOR CH 3W 330	1	
QR404	UN2113	TRANSISTOR-RESISTOR	1	<R>	R4060	ERJ3GEYJ683	M.RESISTOR CH 3W 68K	1	
QR4001, 02	UN5113	TRANSISTOR-RESISTOR	2	<R>	R4061	ERJ3GEYJ334	M.RESISTOR CH 3W 330K	1	
QR4003	UN5211	TRANSISTOR-RESISTOR	1	<R>	R4062	ERJ3GEYJ683	M.RESISTOR CH 3W 68K	1	
QR4004	UN5113	TRANSISTOR-RESISTOR	1	<R>	R4063	ERJ3GEYJ121	M.RESISTOR CH 3W 120	1	
QR4005	UN5211	TRANSISTOR-RESISTOR	1	<R>	R4064	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1	
QR4006	UN5113	TRANSISTOR-RESISTOR	1	<R>	R4065	VRE0034E123	M.RESISTOR CH 1/10W 12K	1	
QR4015	UN5213	TRANSISTOR-RESISTOR	1	<R>	R4066	ERJ3GEYJ101	M.RESISTOR CH 3W 100	1	
QR4016	UN5215	TRANSISTOR-RESISTOR	1	<R>	R4067	ERJ3GEYJ181	M.RESISTOR CH 3W 180	1	
QR4017, 18	UN5213	TRANSISTOR-RESISTOR	2	<R>	R4068	ERJ3GEYJ222	M.RESISTOR CH 3W 2.2K	1	
QR4019	UN5215	TRANSISTOR-RESISTOR	1	<R>	R4069, 70	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	2	
QR4020	UN5213	TRANSISTOR-RESISTOR	1	<R>	R4071	ERJ3GEYJ564	M.RESISTOR CH 3W 560K	1	
QR4021-24	UN5215	TRANSISTOR-RESISTOR	4	<R>	R4072	ERJ3GEYJ331	M.RESISTOR CH 3W 330	1	
QR4025	MRN1402	TRANSISTOR-RESISTOR	1	<R>	R4073	ERJ3GEYJ683	M.RESISTOR CH 3W 68K	1	
QR4026, 27	MRN1403	TRANSISTOR-RESISTOR	2	<R>	R4074	ERJ3GEYJ334	M.RESISTOR CH 3W 330K	1	
QR4028, 29	UN5113	TRANSISTOR-RESISTOR	2	<R>	R4075	ERJ3GEYJ121	M.RESISTOR CH 3W 120	1	
QR4030	UN5212	TRANSISTOR-RESISTOR	1	<R>	R4076	ERJ3GEYJ683	M.RESISTOR CH 3W 68K	1	
QR4031, 32	UN5213	TRANSISTOR-RESISTOR	2	<R>	R4077	ERJ3GEYJ152	M.RESISTOR CH 3W 1.5K	1	
QR4501	UN5213	TRANSISTOR-RESISTOR	1	<R>	R4078	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	1	
QR4502	UN5212	TRANSISTOR-RESISTOR	1	<R>	R4079	ERJ3GEYJ183	M.RESISTOR CH 3W 18K	1	
QR4503	UN5211	TRANSISTOR-RESISTOR	1	<R>	R4080	ERJ3GEYJ513	M.RESISTOR CH 3W 51K	1	
QR4504	XN1501	TRANSISTOR-RESISTOR	1	<R>	R4081	ERJ3GEYJ105	M.RESISTOR CH 3W 1M	1	
QR4505, 06	UN5213	TRANSISTOR-RESISTOR	2	<R>	R4082	ERJ3GEYJ562	M.RESISTOR CH 3W 5.6K	1	
					R4083	ERJ3GEYJ332	M.RESISTOR CH 3W 3.3K	1	
					R4084	ERJ3GEYJ153	M.RESISTOR CH 3W 15K	1	
					R4085	ERJ3GEYJ105	M.RESISTOR CH 3W 1M	1	
		RESISTORS			R4086	ERJ3GEYJ562	M.RESISTOR CH 3W 5.6K	1	
R403, 04	ERJ6GEYG821	M.RESISTOR CH1/16W 820	2		R4087	ERJ3GEYJ513	M.RESISTOR CH 3W 51K	1	
R406	ERJ6GEYG681	M.RESISTOR CH1/16W 680	1		R4088	ERJ3GEYJ153	M.RESISTOR CH 3W 15K	1	
R407	ERJ6GEYJ112	M.RESISTOR CH1/16W 1.1K	1		R4089	ERJ3GEYJ332	M.RESISTOR CH 3W 3.3K	1	
R408	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		R4090	ERJ3GEYJ183	M.RESISTOR CH 3W 18K	1	
R409	ERJ6GEYG183	M.RESISTOR CH1/16W 18K	1		R4091	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	1	
R410	ERJ6GEYG562	M.RESISTOR CH1/16W 5.6K	1		R4092	ERJ3GEYJ152	M.RESISTOR CH 3W 1.5K	1	
R411	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1		R4094-00	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	7	
R412	ERJ6GEYJ303	M.RESISTOR CH1/16W 30K	1		R4101	ERJ6GEYJ272	M.RESISTOR CH1/16W 2.7K	1	
R413	ERJ6GEYJ822	M.RESISTOR CH1/16W 8.2K	1		R4102	ERJ6GEYJ562	M.RESISTOR CH1/16W 5.6K	1	
R414	ERJ6GEYJ105	M.RESISTOR CH1/16W 1M	1		R4103	ERJ6GEYJ183	M.RESISTOR CH1/16W 18K	1	
R415	ERJ6GEYG163	M.RESISTOR CH1/16W 16K	1		R4104	ERDS2TJ4R7	C.RESISTOR 1/4W 4.7	1	
R416	ERJ6GEYJ393	M.RESISTOR CH1/16W 39K	1		R4105	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R417	ERJ6GEYJ113	M.RESISTOR CH1/16W 11K	1		R4106	ERJ6GEYJ105	M.RESISTOR CH1/16W 1M	1	
R418	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1		R4107	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R420	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		R4108	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R421	ERJ6GEYJ123	M.RESISTOR CH1/16W 12K	1		R4109	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R422	ERJ6GEYJ303	M.RESISTOR CH1/16W 30K	1		R4110	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R423	ERJ6GEYJ104	M.RESISTOR CH1/16W 100K	1		R4111	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1	
R424	ERJ6GEYG562	M.RESISTOR CH1/16W 5.6K	1		R4112	ERJ6GEYJ473	M.RESISTOR CH1/16W 47K	1	
R425	ERJ6GEYG183	M.RESISTOR CH1/16W 18K	1		R4113	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1	
R426	ERJ6GEYJ103	M.RESISTOR CH1/16W 10K	1		R4114	ERJ6GEYJ472	M.RESISTOR CH1/16W 4.7K	1	
R427	ERJ6GEYJ112	M.RESISTOR CH1/16W 1.1K	1		R4115	ERJ6GEYJ561	M.RESISTOR CH1/16W 560	1	
R428	ERJ6GEYG681	M.RESISTOR CH1/16W 680	1		R4116	ERJ6GEYJ105	M.RESISTOR CH1/16W 1M	1	
R429	ERJ6GEYG821	M.RESISTOR CH1/16W 820	1		R4117-20	ERJ6GEYJ332	M.RESISTOR CH1/16W 3.3K	4	
R431	ERJ6GEYG821	M.RESISTOR CH1/16W 820	1		R4121	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R433	ERJ6GEYJ333	M.RESISTOR CH1/16W 33K	1		R4122	ERJ6GEYJ000	M.RESISTOR CH 1/10W 0	1	
R434	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1		R4124	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	1	
R435	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1		R4125	ERJ6GEYJ000	M.RESISTOR CH 1/10W 0	1	
R436	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1		R4127, 28	ERJ6GEYJ222	M.RESISTOR CH1/16W 2.2K	2	
R437	ERJ6GEYJ331	M.RESISTOR CH1/16W 330	1		R4130-34	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	5	
R438	ERJ6GEYJ102	M.RESISTOR CH1/16W 1K	1		R4135	ERJ3GEYJ392	M.RESISTOR CH 3W 3.9K	1	
R439	ERJ6GEYJ223	M.RESISTOR CH1/16W 22K	1		R4136	ERJ3GEYJ472	M.RESISTOR CH 3W 4.7K	1	
R440	ERJ6GEYJ225	M.RESISTOR CH1/16W 2.2M	1		R4137	ERJ3GEYJ392	M.RESISTOR CH 3W 3.9K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R4138	ERJ3GEYJ472	M.RESISTOR CH 3W 4.7K	1		VR4504	EVM7DGA00B24	V.RESISTOR 20K	1	
R4139,40	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	2		VR4505,06	EVM7JGA00B53	V.RESISTOR	2	
R4141,42	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	2		VR4507	EVM7DGA00B25	V.RESISTOR 200K	1	
R4501	ERJ3GEYG512	M.RESISTOR CH 3W 5.1K	1						
R4502	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1						
R4503	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1						
R4504	ERJ3GEYG512	M.RESISTOR CH 3W 5.1K	1				MISCELLANEOUS		
R4505-07	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	3			VSC4001	SHIELD CASE (TOP)	1	
R4509	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1			VSC4002	SHIELD CASE (MAIN)	1	
R4510	ERJ3GEYJ822	M.RESISTOR CH 3W 8.2K	1			VSC4003	SHIELD CASE (BOTTOM)	1	
R4511,12	ERJ3GEYJ562	M.RESISTOR CH 3W 5.6K	2						
R4513	ERJ3GEYJ822	M.RESISTOR CH 3W 8.2K	1						
R4514	ERJ3GEYJ332	M.RESISTOR CH 3W 3.3K	1						
R4515	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1						
R4516	ERJ3GEYJ563	M.RESISTOR CH 3W 56K	1						
R4517	ERJ3GEYJ104	M.RESISTOR CH 3W 100K	1						
R4518	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1		-----	VEP051621	P.C. BOARD W/COMPONENT HEAD AMP		
R4519,20	ERJ3GEYJ682	M.RESISTOR CH 3W 6.8K	2						
R4521	ERJ3GEYJ822	M.RESISTOR CH 3W 8.2K	1						
R4522	ERJ3GEYJ222	M.RESISTOR CH 3W 2.2K	1						
R4523	ERJ3GEYJ333	M.RESISTOR CH 3W 33K	1						
R4524,25	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	2						
R4526	ERJ3GEYJ681	M.RESISTOR CH 3W 680	1						
R4527	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	1						
R4528	ERJ3GEYJ182	M.RESISTOR CH 3W 1.8K	1				CAPACITORS		
R4529,30	ERJ3GEYJ152	M.RESISTOR CH 3W 1.5K	2		C5001	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
R4531	ERJ3GEYJ182	M.RESISTOR CH 3W 1.8K	1		C5002,03	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	2	
R4532	ERJ3GEYJ821	M.RESISTOR CH 3W 820	1		C5004	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
R4533	ERJ3GEYJ182	M.RESISTOR CH 3W 1.8K	1		C5005	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
R4534	ERJ3GEYJ473	M.RESISTOR CH 3W 47K	1		C5006-08	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	3	
R4535	ERJ3GEYJ223	M.RESISTOR CH 3W 22K	1		C5009	ECUM1H182JN	C.CAPACITOR CH 50V 1800P	1	
R4536,37	ERJ3GEYJ562	M.RESISTOR CH 3W 5.6K	2		C5010	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
R4539	ERJ3GEYJ223	M.RESISTOR CH 3W 22K	1		C5011	ECEA1CKA220	E.CAPACITOR 16V 22U	1	
R4540	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1		C5012	ECUM1H473ZF	C.CAPACITOR CH 50V 0.047U	1	
R4541	ERJ3GEYJ223	M.RESISTOR CH 3W 22K	1		C5013	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
R4542	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	1		C5014	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
R4543	ERJ3GEYJ330	M.RESISTOR CH 3W 33	1		C5015	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
R4544	ERJ3GEYJ563	M.RESISTOR CH 3W 56K	1		C5016	ECEA1EKA47	E.CAPACITOR 25V 4.7U	1	
R4545	ERJ3GEYJ561	M.RESISTOR CH 3W 560	1		C5017	ECUM1H080DCN	C.CAPACITOR CH 50V 8P	1	
R4546	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1		C5018,19	ECUM1C224ZF	C.CAPACITOR CH 16V 0.22U	2	
R4547	ERJ3GEYJ563	M.RESISTOR CH 3W 56K	1		C5020	ECEA1EKA47	E.CAPACITOR 25V 4.7U	1	
R4548	ERJ3GEYJ561	M.RESISTOR CH 3W 560	1		C5021	ECUM1H080DCN	C.CAPACITOR CH 50V 8P	1	
R4549	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	1		C5022	ECEA1EKA47	E.CAPACITOR 25V 4.7U	1	
R4550	ERJ3GEYJ563	M.RESISTOR CH 3W 56K	1		C5023	ECUM1H020DCN	C.CAPACITOR CH 50V 2P	1	
R4551	ERJ3GEYJ561	M.RESISTOR CH 3W 560	1		C5024,25	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	2	
R4552-54	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	3		C5026	ECUM1H020DCN	C.CAPACITOR CH 50V 2P	1	
R4555-58	ERJ3GEYJ473	M.RESISTOR CH 3W 47K	4		C5027	ECEA1EKA47	E.CAPACITOR 25V 4.7U	1	
R4559-62	ERJ3GEYJ103	M.RESISTOR CH 3W 10K	4		C5028	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
R4563,64	ERJ3GEYJ470	M.RESISTOR CH 3W 47	2		C5029	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
R4566	ERJ3GEYJ102	M.RESISTOR CH 3W 1K	1		C5030	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	1	
R4567	ERJ3GEYJ181	M.RESISTOR CH 3W 180	1		C5031	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
					C5032,33	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	2	
					C5034	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1	
					C5035	ECEA0JKA470	E.CAPACITOR 6.3V 47U	1	
RY4001	VSY2067	RELAY	1		C5036	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	1	
					C5037,38	ECUM1H103KBN	C.CAPACITOR CH 50V 0.01U	2	
					C5039,40	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	2	
T4001	VLT0538	TRANSFORMER	1		C5042	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
					C5043	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
					C5044,45	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	2	
					C5046	ECUM1H471JCN	C.CAPACITOR CH 50V 470P	1	
					C5047	ECEA1HKA010	E.CAPACITOR 50V 1U	1	
VR401	EVM7JGA00B24	V.RESISTOR 20K	1		C5048	ECUM1H472ZF	C.CAPACITOR CH 50V 4700P	1	
VR402	EVM7JGA00B14	V.RESISTOR	1		C5056,57	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	2	
VR403	EVM7JGA00B54	V.RESISTOR 50K	1		C5058	VCYE1C104MR1	S.CAPACITOR 16V 0.1U	1	
VR405	EVM7JGA00B14	V.RESISTOR	1		C5059	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
VR406	EVM7JGA00B54	V.RESISTOR 50K	1		C5060	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
VR407	EVM7JGA00B24	V.RESISTOR 20K	1		C5061	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
VR4001	EVM7DGA00B24	V.RESISTOR 20K	1		C5062	ECUM1H103ZF	C.CAPACITOR CH 50V 0.01U	1	
VR4002	EVM7DGA00B14	V.RESISTOR 10K	1		C5063	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
VR4003	EVM7DGA00B24	V.RESISTOR 20K	1		C5066	ECUM1C224ZF	C.CAPACITOR CH 16V 0.22U	1	
VR4004-06	EVM7DGA00B14	V.RESISTOR 10K	3						
VR4007,08	EVN32CA00B25	V.RESISTOR 200K	2						
VR4501,02	EVM7DGA00B23	V.RESISTOR 2K	2						
VR4503	EVM7DGA00B14	V.RESISTOR 10K	1		D5001,02	MA151K	DIODE	2	<R>

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
D5004	MA151K	DIODE	1	<R>					
							MISCELLANEOUS		
						VSC3119	SHIELD CASE (MAIN)	1	
IC5001	AN3334K	IC	1	<R>		VSC3039	SHIELD CASE (TOP)	1	
IC5002	BA7740F5	IC	1	<R>		VSC3040	SHIELD CASE (BOTTOM)	1	
IC5003	AN3370K	IC	1	<R>		VJF0215	BINDER	1	
L5001-04	VLQ0460	COIL	4						
L5007	VLQ0460	COIL	1						
L5008	VLQ0188J5R6	COIL	5.6UH 1		*****	VEP06920B	P.C.BOARD W/COMPONENT SYSCON & SERVO		
P5001	VJP3091	CONNECTOR (MALE)	1						
P5002	VJS2603	CONNECTOR (FEMALE)	1						
P5003	VJP3091	CONNECTOR (MALE)	1						

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C2324	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		C6043, 44	ECUM1H221KBN	C.CAPACITOR CH 50V 220P	2	
C2325	ECEA1CKA470	E.CAPACITOR 16V 47U	1		C6045	ECUM1H271KBN	C.CAPACITOR CH 50V 270P	1	
C2326, 27	ECEAOJKA470	E.CAPACITOR 6.3V 47U	2		C6046, 47	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
C2328	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	1		C6048	ECEA1EU470	E.CAPACITOR 25V 47U	1	
C2329, 30	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	2		C6049	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1	
C2333	ECEA1HKN2R2	E.CAPACITOR 50V 2.2U	1		C6050	ECEA1EKA470	E.CAPACITOR 25V 47U	1	
C2336	ECEA1HKN2R2	E.CAPACITOR 50V 2.2U	1		C6051	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1	
C2337, 38	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	2		C6052	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1	
C2339	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1						
C2340	ECEA1HKN4R7	E.CAPACITOR 50V 4.7U	1						
C2343, 44	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	2						
C2501	ECQB1H473JF	P.CAPACITOR 50V 0.047U	1		D2001	MA151MK	DIODE	1	<R>
C2502	ECQB1H222JF	P.CAPACITOR 50V 2200P	1		D2003, 04	11EQS04	DIODE	2	<R>
C2503	ECQB1H273JF	P.CAPACITOR 50V 0.027U	1		D2005	MA151MK	DIODE	1	<R>
C2504	ECQB1H222JF	P.CAPACITOR 50V 2200P	1		D2304, 05	MA153	DIODE	2	<R>
C2510	ECEA1CKA470	E.CAPACITOR 16V 47U	1		D2306	MA4062M	DIODE	1	<R>
C2512-14	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	3		D2501, 02	MA151K	DIODE	2	<R>
C2516-19	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	4		D2901	MA3160-L	DIODE	1	<R>
C2901	ECEA1CKA101	E.CAPACITOR 16V 100U	1		D2902	11DQ04	DIODE	1	<R>
C2902	ECEA1HKA010	E.CAPACITOR 50V 1U	1		D2903	MA3160-L	DIODE	1	<R>
C2903	ECUM1H271JCN	C.CAPACITOR CH 50V 270P	1		D2904	11DQ04	DIODE	1	<R>
C2904	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1		D2905	MA3160-L	DIODE	1	<R>
C2905	ECUM1H561JCN	C.CAPACITOR CH 50V 560P	1		D2906	11DQ04	DIODE	1	<R>
C2906	ECEA1HKA010	E.CAPACITOR 50V 1U	1		D2907	MA701	DIODE	1	<R>
C2907	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		D2908	8P2M	DIODE	1	<R>
C2908	ECQB1H222JF	P.CAPACITOR 50V 2200P	1		D2909	MA3020	DIODE	1	<R>
C2909	ECEA1EU221	E.CAPACITOR 25V 220U	1		D2911	MA151K	DIODE	1	<R>
C2910	ECEA1H4U47	E.CAPACITOR 50V 4.7U	1		D2912	MA4140-M	DIODE	1	<R>
C2911	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1		D2913	MA3140-M	DIODE	1	<R>
C2912	ECEA1EU221	E.CAPACITOR 25V 220U	1		D2914-16	MA3160-H	DIODE	3	<R>
C2913	ECEA1H4U47	E.CAPACITOR 50V 4.7U	1		D2917-19	MA151K	DIODE	3	<R>
C2914	ECUM1H102KBN	C.CAPACITOR CH 50V 1000P	1		D2920	MA3068M	DIODE	1	<R>
C2915	ECEA1EU221	E.CAPACITOR 25V 220U	1		D2921	MA165VT	DIODE	1	<R>
C2916, 17	ECEA1EU101	E.CAPACITOR 25V 100U	2		D2922	MA3110-H	DIODE	1	<R>
C2918	ECEA1CKA101	E.CAPACITOR 16V 100U	1		D6001	MA4075M	DIODE	1	<R>
C2919	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		D6002	MA151K	DIODE	1	<R>
C2920	ECQV1H104JZ	P.CAPACITOR 50V 0.1U	1		D6003	11EQS04	DIODE	1	<R>
C2921	ECEA1HKA2R2	E.CAPACITOR 50V 2.2U	1		D6004	10E1	DIODE	1	<R>
C2922	ECEA1CKA101	E.CAPACITOR 16V 100U	1		D6005	MA170	DIODE	1	<R>
C2923	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		D6006	MA151K	DIODE	1	<R>
C2925	ECEA1EU101	E.CAPACITOR 25V 100U	1		D6007	MA153	DIODE	1	<R>
C2926	ECEA1CKA330	E.CAPACITOR 16V 33U	1		D6008	MA151K	DIODE	1	<R>
C6001	ECEA1EU4R7	E.CAPACITOR 25V 4.7U	1		D6009	11EQS04	DIODE	1	<R>
C6002	ECQB1H104JF	P.CAPACITOR 50V 0.1U	1		D6010	MA153	DIODE	1	<R>
C6003, 04	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	2		D6011	10E1	DIODE	1	<R>
C6005, 06	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2		D6012	MA151K	DIODE	1	<R>
C6007, 08	ECEA1ASS332	E.CAPACITOR 10V 3300U	2		D6013	MA170	DIODE	1	<R>
C6009	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1		D6014	MA151K	DIODE	1	<R>
C6010	ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1		D6015, 16	MA153	DIODE	2	<R>
C6011	ECEA1CU222	E.CAPACITOR 16V 2200U	1		D6017	MA4075M	DIODE	1	<R>
C6012	ECEA1HKA010	E.CAPACITOR 50V 1U	1		D6018	MA153	DIODE	1	<R>
C6013	ECEAOJKA470	E.CAPACITOR 6.3V 47U	1						
C6014	ECEA1CKA470	E.CAPACITOR 16V 47U	1						
C6015	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1						
C6016	ECEA1CKA100	E.CAPACITOR 16V 10U	1		IC2001	MN6743VCRH	IC	1	<R>
C6017	ECQB1H472JF	P.CAPACITOR 50V 4700P	1		IC2003	MN1382-R	IC	1	<R>
C6018	ECQB1H333JF	P.CAPACITOR 50V 0.033U	1		IC2004	AN3727S	IC	1	<R>
C6019	ECQB1H103JF	P.CAPACITOR 50V 0.01U	1		IC2007	MC14011BF	IC	1	<R>
C6020	ECEA1CKA470	E.CAPACITOR 16V 47U	1		IC2010	UPC35862	IC	1	<R>
C6021	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		IC2011	MC14070BF	IC	1	<R>
C6022	ECEA1CKA470	E.CAPACITOR 16V 47U	1		IC2012	TC7S04F	IC	1	
C6023	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	1		IC2014	LM393PS	IC	1	<R>
C6024-27	ECQB1H102JF	P.CAPACITOR 50V 1000P	4		IC2301	AN3815K	IC	1	<R>
C6028	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1		IC2302	XRA6435S	IC	1	<R>
C6029, 30	ECEA1CKA100	E.CAPACITOR 16V 10U	2		IC2304	LM393PS	IC	1	<R>
C6031	ECEA1CKA470	E.CAPACITOR 16V 47U	1		IC2305	UPC4556G2	IC	1	<R>
C6032	ECEA1HKN010	E.CAPACITOR 50V 1U	1		IC2307	AN78N12	IC	1	<R>
C6033, 34	ECQB1H104JF	P.CAPACITOR 50V 0.1U	2		IC2501, 02	LM324NS	IC	2	<R>
C6035	ECEA1CKA101	E.CAPACITOR 16V 100U	1		IC2503	LM393PS	IC	1	<R>
C6036	ECEA1CN101	E.CAPACITOR 16V 100U	1		IC2505	MC14053BF	IC	1	<R>
C6037	ECEAOJKA470	E.CAPACITOR 6.3V 47U	1		IC2506	MC14052BF	IC	1	<R>
C6038, 39	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	2		IC2507	MC14053BF	IC	1	<R>
C6040	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1		IC2901	BA6149LS	IC	1	<R>
C6041	ECEA1CKA220	E.CAPACITOR 16V 22U	1		IC2902	LM393PS	IC	1	<R>
C6042	ECUM1E104ZFN	C.CAPACITOR CH 25V 0.1U	1		IC6001	MN188241OH8C	IC	1	<R>

PRT — 24

PRT — 26

PRT — 28

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Order No. VSD9605S207
D2, D4

Service Manual

Supplement

NTSC / PAL Video Product

Subject : Change of HEAD AMP C.B.A.

Please use this supplement together with the Service Manual as follows :			
Model No.	Bulletin No.	Order No.	Effective from
AG-MD830P	18	VSD9403M246	B5T
AG-MD830E	13	VSD9408M637	B5T
AG-7350-P	53	VSD9106M207	B5T
AG-7350RP	16	VSD9203M216	B5T
AG-7355-P	27	VSD9110M212	B5T
AG-7355RP	16	VSD9203M216	B5T
AG-7150-P	52	VSD9106M207	B5T
AG-7150-E/B	49	VSD9109M615	B5T
AG-7350-E/B	51	VSD9109M615	B5T
AG-7355-E/B	35	VSD9110M616	B5T
AG-6730P	35	VSD9206M222	B5T
AG-6730E	32	VSD9212M628	B5T
AG-6760P	24	VSD9210M227	B5T
AG-DS850P	77	VSD9403M244	B5T
AG-6045E	4	VSD9501M640	B5T

Board: HEAD AMP C.B.A.

The circuit board pattern has been changed for productivity, reliability and serviceability of the board.

Interchangeability Code (I/C)								
A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.							
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.							
C	New parts only may be used in early or late production sets.							
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.							
E	Others							
Part Number								
Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions			Pcs	I/C	Remarks
R5040	ERDS2TJ151	ERDS2TJ221	C.RESISTOR	1/4W	220	1	D	AG-MD830P/E, 7350-P/RP/E/B, AG-7355-P/RP/E/B, 6760P
R5062	_____	ERDS2TJ221	C.RESISTOR	1/4W	220	1	D	AG-MD830P/E, 7350-P/RP/E/B, AG-7355-P/RP/E/B, 6760P
R5070	ERDS2TJ472	_____				0	E	AG-MD830P/E

TE2-4122

Part Number						
Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
R5070	ERDS2TJ472	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	D	AG-7350-P/RP/E/B,7355-P/RP/E/B
R5070	-----	ERJ6GEY0R00	M.RESISTOR CH 0	1	E	AG-6760P
R5041	ERJ6GEYJ180	ERJ6GEYJ100	M.RESISTOR CH 1/10W 10	1	D	AG-7350-P/RP/E/B,7355-P/RP/E/B AG-6760P, AG-DS850P
R5060	-----	ERJ6GEY0R00	M.RESISTOR CH 0	1	E	AG-7350-P/RP/E/B,7355-P/RP/E/B AG-6730P/E, 6760P
R5061	ERJ6GEY0R00	-----		0	E	AG-6760P
Q5006	2SD1450	-----		0	E	AG-6760P, 6045E
IC5003	-----	2SD1450	TRANSISTOR	1	E	AG-6760P, 6045E
C5057	-----	ERJ6GEY0R00	M.RESISTOR CH 0	1	E	AG-6760P
C5060	-----	ERJ6GEY0R00	M.RESISTOR CH 0	1	E	AG-6760P
W5001	ERJ6GEY0R00	-----	M.RESISTOR CH 0	1	E	AG-6760P

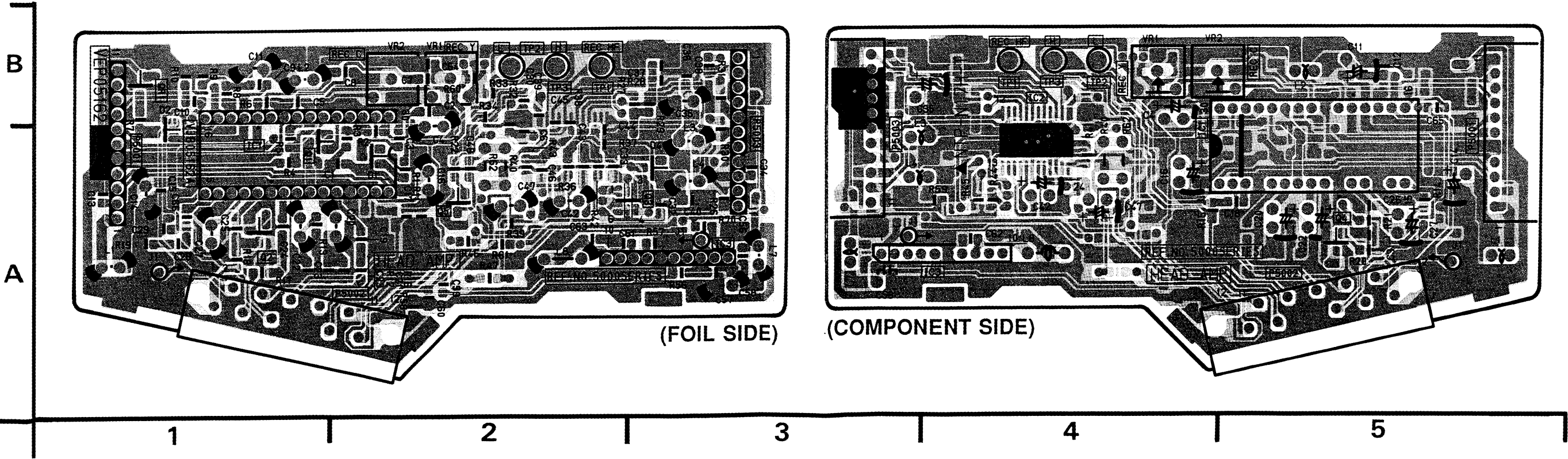
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HEAD AMP C.B.A.

HEAD AMP C.B.A.					
Transistor			Adjustment		
Q5001	A-1		VR5001	B-2	
Q5002	A-1		VR5001	B-4	
Q5003	A-3		VR5002	B-2	
Q5004	A-5		VR5002	B-4	
Q5005	A-2				
Transistor & Resistor			Connector		
QR5001	B-1		P5001	A-1	
			P5001	A-5	
			P5002	A-2	
			P5002	A-5	
			P5003	A-3	
			P5003	A-3	
Test Point					
TP5001	B-2				
TP5001	B-4				
TP5002	B-2				
TP5002	B-4				
TP5003	B-2				
TP5003	B-4				

ADDRESS INFORMATION



⚠WARNING
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Order No. VSD9501S602

Service Manual

Supplement

Video Product

Subject: Change of HIC

Please use this supplement together with the Service Manual as follows:

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830E	2	VSD9408M637	A5 - - -

Board : VIDEO (1)

Symptom : When a tape which has skew is played back, the APC circuit may not perform properly.

Remedy : The H-IC on the video 1 C.B.A. has been changed from VCR0380 to VCR0383.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.	B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.	D	Original parts may be used in early production sets only.
E	Other		New parts may be used in late production sets only. Stock both original and new parts.

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
IC3801	VCR0380	VCR0383	IC	1	C	

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Printed in Japan

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Order No. VSD9605S204
D4

Service Manual

Supplement

NTSC / PAL

Video Product

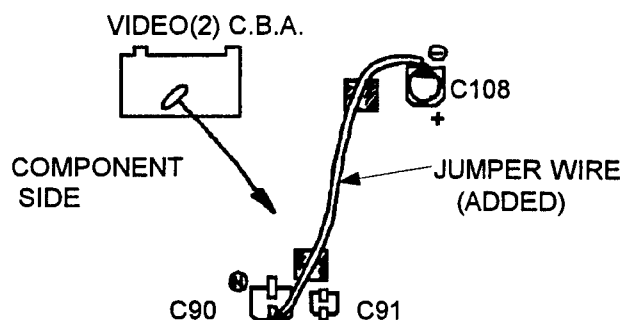
Subject : Improvement of EE Chrominance Level

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830P	16	VSD9403M246	I4T
AG-MD830E	11	VSD9408M637	I4T

Board: VIDEO (2) C.B.A.

In order to improve the EE Chrominance level (out of spec.), following modification has been performed.



Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
R3351	ERJ6GEYJ122	ERJ6GEYJ132	M.RESISTOR CH 1/10W 1.3K	1	C	
R3372	ERJ6GEYJ132	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	C	
R3375	ERJ6GEYJ122	ERJ6GEYJ112	M.RESISTOR CH 1/10W 1.1K	1	C	
R3435-37	ERJ6GEYJ750	ERJ6GEYG750	M.RESISTOR CH 1/10W 75	1	C	
IC3310	NJM2233BMA	-----		0	E	
C3382	ECUM1H271JCN	-----		0	E	
C3390	ECEV0JN470S	-----		0	E	
C3391	ECEV0JV470S	-----		0	E	

TE2-3986

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Subject : Countermeasure of malfunction in Audio Dubbing

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830P	17	VSD9403M246	I4T
AG-MD830E	12	VSD9408M637	I4T

Board: AUDIO C.B.A.

SYMPTON: During Audio Dubbing mode, the level of recorded audio signal which is the other track of audio dubbing track may be reduced (erased) about 3dB.

REMEDY: The following modification has been performed.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
R4104	ERDS2TJ4R7	ERDS2TJ120	C.RESISTOR 1/4W 12	1	C	AG-MD830P
R4104	ERDS2TJ4R7	ERDS2TJ150	C.RESISTOR 1/4W 15	1	C	AG-MD830E
R4107	ERJ6GEYJ333	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	C	AG-MD830P
R4107	ERJ6GEYJ473	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	C	AG-MD830E
R4112	ERJ6GEYJ333	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	C	AG-MD830P
R4112	ERJ6GEYJ473	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	C	AG-MD830E
				0	E	
				0	E	

TE2-4021

! Warning

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Order No. VSD9605S601

Service Manual

Supplement

Video Product

Subject : Correction of Service Manual

Please use this supplement together with the Service Manual as follows :

Model No.
AG-MD830E

Bulletin No.
9

Order No.
VSD9408M637

The information in the service manual has been corrected as follows.

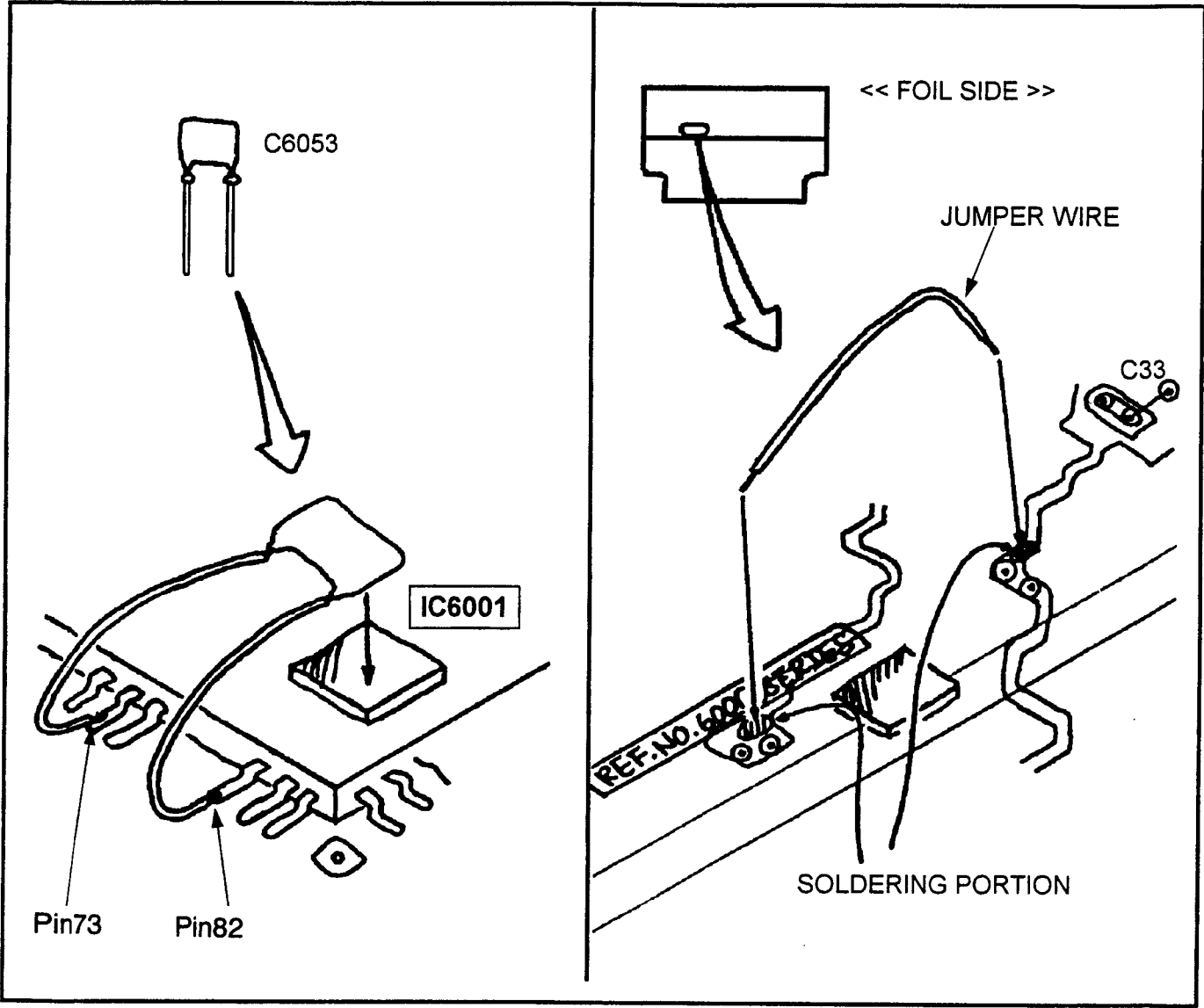
Part Number						
Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
C6053	-----	ECQV1H274JZ	P.CAPACITOR 50V 0.27UF	1	E	
C6044	ECUV1H221KBN	-----		0	E	
R3016	ERJ6GEYJ122	ERJ6GEYJ821	M.RESISTOR CH 1/16W 820	1	C	
R3017	ERJ6GEYJ122	ERJ6GEYJ471	M.RESISTOR CH 1/16W 470	1	C	
R3014	ERJ6GEYJ103	ERJ6GEYJ102	M.RESISTOR CH 1/16W 1K	1	C	

TE2-3943, TE2-3953

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SYSCON & SERVO C.B.A.



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Order No. VSD9605S602

Service Manual

Supplement

Video Product

Subject : Change of Transistor

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830E	10	VSD9408M637	I4T

Board: SYSCON & SERVO C.B.A.

In order to increase hfe of transistor, following transistor has been changed.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
QR2904	MRN2404	MRN2402	TRANSISTOR-RESISTOR	1	C	

TE2-3961

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Order No. VSD9608S603
D

Service Manual

Supplement

Video Product

Subject : Change of Capacitor

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-7150-E/B	50	VSD9109M615	A5---
AG-7350-E/B	53	VSD9109M615	A5---
AG-7355-E/B	38	VSD9110M616	A5---
AG-6040E	30	VSD9209M625	A5---
AG-6730E	34	VSD9212M628	A5---
AG-6045E	5	VSD9501M640	A5---
AG-5700-E	18	VSD9202M619	A5---
AG-MD830E	15	VSD9408M637	A5---
AG-6840HE/B	32	VSD9004M602	A5---
AG-6850H-E/B	32	VSD9006M603	A5---
AG-6124E/B	9	VSD9406M635	A5---
AG-5260E/B	9	VSD9404M633	A5---
AG-7600E	8	VSD9502M642	A5---
AG-7700E	12	VSD9502M642	A5---
AG-8600E	6	VSD9512M601	A5---
AG-8700E	6	VSD9512M601	A5---

Board: POWER

Reason for Change

- ☐ The following part(s) has(have) been changed for serviceability improvement.
- ☐ The following part(s) has(have) been changed for productivity improvement.
- ☐ The following part(s) has(have) been changed for standardization.
- ☒ The following part(s) has (have) been changed for the safety regulation.
- ☐

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Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
C1008	VCK0041	VCK0259K331A	CAPACITOR	1	C	AG-7150/7350/7355-E/B
C1045	VCK0041	VCK0259K331A	CAPACITOR	1	C	AG-7150/7350/7355-E/B
C1003-5	VCK0040	VCK0259K221A	CAPACITOR	3	C	AG-7150/7350/7355-E/B
C1005	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6045E
C1010	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6045E
C10038	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1001-3	VCC0046	VCK0260K222A	CAPACITOR	3	C	AG-6040/6730/6450E
C1006	VCC0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1036	VCC0046	VCK0260K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1037	VCC0024	VCK0262K222A	CAPACITOR	1	C	AG-6040/6730/6450E
C1002-3	VCK0083	VCK0260M332A	CAPACITOR	2	C	AG-MD830E/B
C1004-5	VCK0043	VCK0259M102A	CAPACITOR	2	C	AG-MD830E/B
C1102-5	VCK0083	VCK0260M332A	CAPACITOR	4	C	AG-5700-E
C1003-4	VCK0046	VCK0260K222A	CAPACITOR	2	C	AG-6840H/6850HE
C1005	VCK0046	VCK0260K222A	CAPACITOR	1	C	AG-6840H/6850HE
C1027-28	VCK0045	VCK0260K152A	CAPACITOR	2	C	AG-6840H/6850HE
C1029	VCK0045	VCK0260K152A	CAPACITOR	1	C	AG-6840H/6850HE
C1010	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-5260E/B
C1011	VCC0046	VCK0260M222A	CAPACITOR	1	C	AG-5210E/B
C1012	VCC0046	VCK0260M222A	CAPACITOR	1	C	AG-5210E/B
C1010	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1011-12	VCK0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C1001	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1002-3	VCC0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C004	VCC0024	VCK0262M222A	CAPACITOR	1	C	AG-6124/5260E/B
C1005-6	VCC0046	VCK0260M222A	CAPACITOR	2	C	AG-6124/5260E/B
C1001-2	VCK0083	VCK0260M332A	CAPACITOR	2	C	AG-7600/7700/8600/8700E
C1004-5	VCK0044	VCK0260M102A	CAPACITOR	2	C	AG-7600/7700/8600/8700E

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Order No. VSD9805S211
D4

Service Manual

Supplement

NTSC/PAL

Video Product

Subject : Countermeasure for Auto Repeat Playback

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830P	24	VSD9403M246	F7----
AG-MD830E	19	VSD9408M637	F7----

Board: VIDEO 2

Symptom : Playback function may be stopped in the auto repeat mode.

Cause : The "No Video Detection Circuit" may operate correctly due to the temperature charastaric of the AFC circuit on the "No Video Detection Circuit" .

Remedy : In order to prevent this symptom, the type of capacitor (C3318) has been changed.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
C3318	ECUV1H392KBN	ECQB1H392JF	C. CAPACITOR 50V 3900P	1	C	

TE2-4916

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Order No. VSD9805S214
D1,4

Service Manual

Supplement

NTSC / PAL

Video Product

Subject :Change of Bias Transformer

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-6840H-P	49	VRD8909M237	F7----
AG-6850H-P	47	VRD9001M243	F7----
AG-6842HP	11	VSD9302M230	F7----
AG-MD830P	23	VSD9403M246	F7----
AG-7350-P	63	VSD9106M207	F7----
AG-6840H-E/B	36	VSD9004M602	F7----
AG-6850H-E/B	36	VSD9006M603	F7----
AG-MD830E	18	VSD9408M637	F7----
AG-7350-E/B	54	VSD9109M615	F7----

Circuit: AUDIO

Reason for Change

- ☐ The following part(s) has(have) been changed for serviceability improvement.
- ☐ The following part(s) has(have) been changed for productivity improvement.
- ☐ The following part(s) has(have) been changed for standardization.
- ☐ The following part(s) has (have) been changed for the safety regulation.
- ☒ The following part(s) has (have) been changed for durability improvement.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
T4001	VLT0538B	VLT0538C	TRANSFORMER	1	C	

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Order No. VSD9811S603

Service Manual

Supplement

PAL

Video Product

Subject : Change of Delay Circuit

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
AG-MD830E	22	VSD9408M637	K7-----

Board : VIDEO 1

Reason for Change

The following parts have been changed because of discontinuation of Delay Line.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

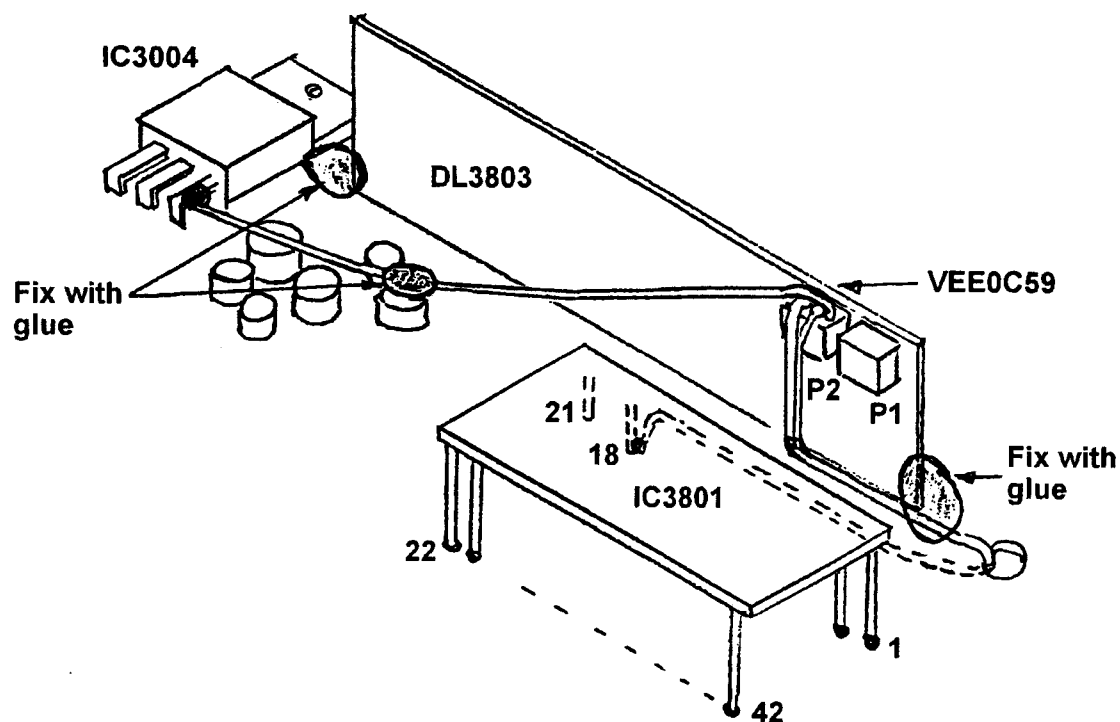
Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
DL3803	VLD0089	VEP00Z44C VEE0C59	DELAY LINE CABLE	1 1	D E	
C3835	ECUM1H680JCN	---		0	E	
L3811	VLQ0163J150	---		0	E	
L3812	VLQ0163J150	---		0	E	
R3837	ERJ6GEYJ561	ERJ6GEYG681	M.RESISTOR CH 1/10W 680	1	D	
R3860	ERJ6GEYJ681	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	D	
	VHN0030	VHN0030	RIVET	2	E	3 Pcs → 2 Pcs

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INSTALLATION OF CABLE



1. Remove the rivet(VHN0030) inserted into the hole by DL3803.
2. Install one side of the cable (VEE0C59) in the connector P2 of DL3803. (The shielding wire should be inserted into the terminal ② and ③. ② is signal and ③ is GND.)
3. Solder the wire of VEE0C59 (the wire connected to the terminal ① of P2 of DL3803) to the terminal 3 of IC3004.
4. Pass the wire of VEE0C59 (the wire connected to the terminal ② of DL3803) through the hole by DL3803 and solder it to the terminal 18 of IC3801.
5. Press down the cable so that the cable should lie along the surface of the P.C.Board.
6. Fix the delay line and the cable with glue as shown in the above figure. (Delay line should be fixed vertically.)

ELECTRICAL ADJUSTMENTS AFTER REPLACEMENT OF DELAY LINE

After replacement of delay line, the following electrical adjustments should be performed.

4-3-7. CNR ADJUSTMENT

PRODUCT INFORMATION

AG-IA232TC (RS-232C Interface)

Panasonic

Matsushita Electric Industrial Co., Ltd.

Audio and Video Systems Division

CONTENTS

1. AG-IA232TC Product Information
2. RS-232C Protocols (Ver. 2)

1. AG-IA232TC Product Information

The RS-232C computer interface has become very popular recently due to its software interfacing which is incorporated into personal computers.

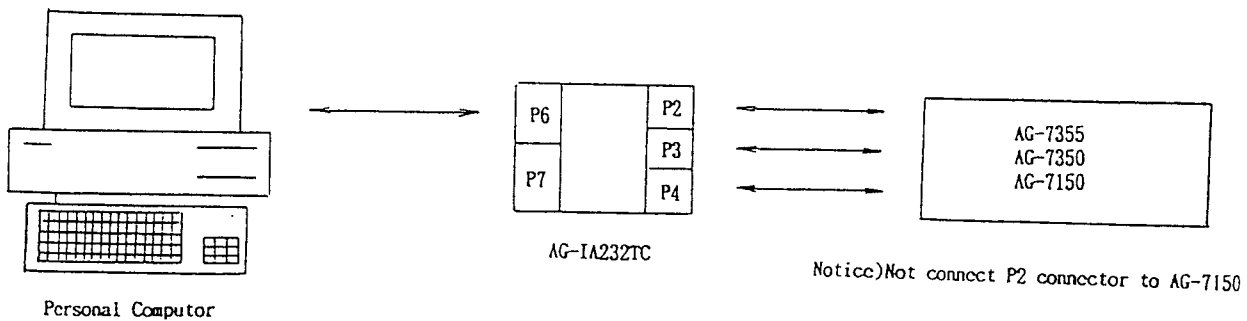
Recently introduced new models (AG-7355, AG-7350 and AG-7150), also incorporate the RS-232C interfacing.

This information explains the AG-IA232TC and RS-232C interface.

1) Product Method

(1) Outline

This model is an optional interfacing board used to control the VTRs (AG-7355, AG-7350, AG-7150) with the RS-232C computer control system. The basic block diagram is shown below.



(2) Functions of this model

- 1) Front key operation
- 2) Address search by CTL/Time Code
- 3) Time Code Generator/Reader
- 4) Mode Status Reading
- 5) Looping through of up to 32 units

(3) VTR control functions are as follows

1) KEY CONTROL

The following VTR modes can be controlled by the RS-232C.

STOP
EJECT
REWIND
FAST FORWARD
STILL/PAUSE
RECORD

AUDIO-DUBBING
PLAY
REVERSE PLAY
REHEARSAL A-DUB
REHEARSAL REC
SHUTTLE SEARCH

2) COUNTER CONTROL

This controls the CTL counter which is inside the interface board as well as the reset counter, counter search and counter data of the VTR.

3) STATUS SENSE

Current Status modes of both interface board and VTRs can be sensed.

4) LTC READER (2 MODELS OF NTSC AND PAL VERSION)

5) LTC GENERATOR (2 MODELS OF NTSC AND PAL VERSION)

A TCG is incorporated and able to perform as follows:

(VTRs must be set to proper modes.)

- (1) Records time code only continuously from beginning to end of tape.
- (2) Records video signal and TC simultaneously from REC RUN POINT.
- (3) Presets time code data.
- (4) Time code has both Free Run and Rec Run. Free Run has both "REGEN" and "PRESET" modes.
- (5) It's able to read and write user's bit.
- (6) Drop/Non Drop Frame Setting.

When an external TCR/G is used, it is not recommended to connect this internal TCR/G. Make sure to set EXT/INT of DSW2-8 to "EXT (OFF)" when the internal TCR/G is connected. If this switch is set to "ON" and the internal TCR/G is connected, the TCR/G this unit does not operate or even may damage the TCR/G.

6) Other Functions

- (1) Reset of transmitting conditions
- (2) ON line checking
- (3) Group number Setting/Reset/Leader setting
- (4) Stanby ON/OFF
- (5) Digital (Other than AG-7355, it becomes
still when a command is received during
playback.)

7) External Interfacing Method

(1) External Transmit Method

RS-232C SERIAL COMMUNICATION CONDITION

BAUD RATE 1200/2400/9600/19200
 BIT LENGTH 8BIT/7BIT
 PARITY NON/ODD/EVEN
 STOP BIT 1/2

* Underline indicates initial setting

Connector : D-SUB 25P DCE Method (Corresponds to the Straight Cable)

INPUT CONNECTOR (P6)

1 FG
 2 RXD (RECEIVE)
 3 TXD (TRANSMIT)
 4 SHORT (CONNECT) TO 5
 5 SHORT (CONNECT) TO 4
 6 SHORT (CONNECT) TO 20
 7 GND 20 SHORT (CONNECT) TO 6

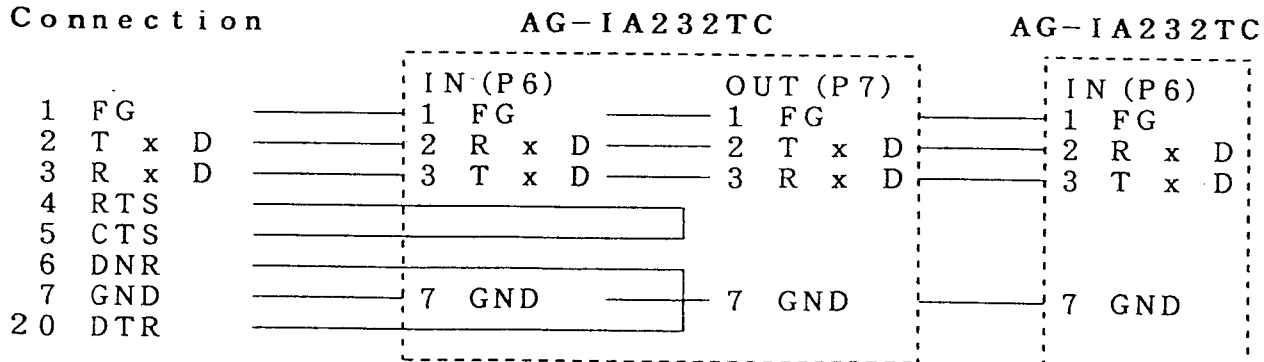
OUTPUT CONNECTOR (P7)

1 FG
 2 TXD (TRANSMIT)
 3 RXD (RECEIVE)
 7 GND

Up to 32 VTRs can be connected by looping through, when looping through function is provided Cable MAX length is 15m.

Note) RS-232C (AG-A730E) can not be connected since the power source is not a personal computer.

Connection



(2) DIP SWITCH Set conditions of transmitting.
Address and INT/EXT of TCG

DIP SW1

1	BIT LENGTH	0. 7BIT
		1. 8BIT
2	STOP BIT	0: STOP 1
		1: STOP 2
3.	4PARITY	(0. 0) ODD
		(1. 0) EVEN
		(X. 1) NON
5.	6Baud Rate	(0. 0) 1200
		(1. 0) 2400
		(0. 1) 9600
		(1. 1) 19200

DIP SW2

1~5	ADDRESS	ADDRESS 0 ~ ADDRESS 31
6	TCG INT/EXT	0: EXTERNAL
		1: INTERNAL
		0-OPEN/OFF
		1-CLOSE/ON

8) Internal Interfacing Method

(1) Internal Transmitting

Connector P4

4.	10-GND
5	-SERIAL DATA (5V _{p-p})
6	-SERIAL CLOCK (5V _{p-p})
7	-CONTROL PULSE (5V _{p-p}) *
8	-OPEN
9	-5V

(2) Time Code Signal

Connector P3

1	-TC IN (AG-IA232TC ⇄ DECK)
2	-GND
3	-TC OUT (DECK ⇄ AG-IA232TC)
4	-GND

Specifications are same as AG-7330.

Connector P2

1	-Hss (REC SYNC)	4V _{pp} (min3. 5)
2	-NC	
3	-GND	

2. RS-232C Protocols

(Ver. 2)

(Notice) This Protocols change in time to time. If any proble should occur contact with your regional sales/service office.

1) Receiving format (controller ⇔ deck)

[STX]([AD][Address] [;]) [Command] [:[Data] ([;][Command] [:[Data]...)[ETX]
 (02h)(41h (0-31, A-Z)(3Bh) (XX XX XX)(3A)(XX-XX) (3Bh)(XX XX XX) (3Ah)(XX-XX) (03h)
 .44h) ascii code 20h < XX < 7Fh

() Data in parentheses () may be omitted.
 AD Address identifier. This shall be AD' (binary 41h, 44h) in ASCII code.
 Address Address data. This shall be 2 characters. Addresses shall be 0 to 31 (limited by hardware). Groups shall be 0A to 0Z.
 ; The semicolon shall follow the address designation, and shall serve as the code to separate commands. Use of the semicolon allows multiple commands (and data).
 Command Command idetifier. Commands shall be 3 byte identifiers.
 : The colon shall separate commands and data.
 Data This adds data with the required number of bytes.

(1) When a single deck is connected to the controller

The transmit command starts with STX (Start of Text = 02h). Command then identifies the command and adds the required data. Transmission ends with ETX(End of Text = 03h).

(2) When multiple decks are connected to the controller

After the above-described STX is received, the identifier (AD) and deck address or group number are added to designate one of several, or a group of decks.

When one statement contains several commands, commands are effected for that address from the time of identifier (AD) reception until the final ETX signal is received.

Once an address has been received, it cannot be changed until the next STX is transmitted — an error is generated if you try to change the address. When there is a command without a designated address, all connected decks receive and respond to the command, so addresses (or groups) must be designated when several decks are connected. With no designation, the hardware competes for communication lines, preventing proper transmission.

When the group number is received, data remaining in the transmit buffer is immediately cleared, and the communication line then goes to standby. The group number is set by the 232C command.

The 232C command can also designate one deck within the group as group leader.

In this case, the groupsetting command triggers only the group leader to return ACK and NACK signals. Group leader designation is only in effect when the group number has been designated

Standby condition High-impedance condition for the communication line.

Address: Indecated the deck's absolute address. Hardware designates one address per unit. The protocol address is given in two-column formats from 00 (30h 30h) to 9 9(39h 39h): The absolute addresses for hardware are 00 to 31 for connecting up to 32 units. Designating addresses other than these has no effect because no other addresses exist.

Group number: This number indicates a group of decks. It allows several decks to be designated. The number is set by the RGS command. Up to 26 groups can be desingated in two-column formats ranging from 0A(30h 41h) to 0Z(30h 5Ah). The default group number, such as when power is turned on, shall be 0A(30h 41h).

(3) If STX is re-input before ETX is input, the internal transmit buffer on the deck side is cleared, priority is given to the received STX signal, and the buffer waits for the next command (or address) after STX to be input.

(4) When the internal transmit buffer on the deck side is full, it clears and then waits for the next command.

2) Transmit format (deck \Rightarrow controller)

When several commands are transmitted simultaneously, an ACK command signal is transmitted to last command received (prior to the ETX transmission). This is not true for the NACK return signal.

(1) ACK without answer

Returns the transmitte identifier.

[STX] + [Command] + [ETX]

(02h) (41h-5Fh)(03h)

Example: [STX] OPL [ETX] \Rightarrow [STX] OPL [ETX]

(2) ACK with answer

Returns required data and identifiers after the second byte.

[STX] + [Command After 2nd Byte] + [Data] + [ETX]

(02h) (XX XX) (XX XX) (03h)

Example: [STX] QOP [ETX] \Rightarrow [STX] OEJ [ETX]

(3) NACK

When an NACK signal is transmitted, details indicating the reason why reception failed are returned in the form below: If an abnormal communication condition error is detected, the error signal is sent ahead of the NACK signal. This interrupts any data currently being transmitted, regardless of whether it has been completely received or not. Thus, the NACK signal is sent immediately, triggering the standby mode to await the next STX signal. NACK is only transmitted if a group leader is designated in the group setting mode several commands trasmitted simultaneously (transmitted in sections, each separated by a semicolon ';') generates an error. The transmit and receive buffers clear at that point to await the next STX signal.

[STX] + [E] + [R] + [ERROR CODE] + [ETX]

(02h) (45h)(52h) (03h)

1(31) : VTR MODE ERROR(Abnormal of sensing tape end or start point)

2(32) : VTR MODE ERROR(Elevator)

3(33) : VTR MODE ERROR(Tape loading)

4(34) : VTR MODE ERROR(Cylinder)

5(35) : VTR MODE ERROR(Rcel)

6(36) : VTR MODE ERROR(Tension)

7(37) : VTR MODE ERROR(Tripped solenoid)

D(44) : VTR DEW

E(45) : COMMAND AND DATA SET ERROR

* Command and data setting error :Generated on reception of a non-existent command, an incorrect data code, data outside of the allowable range, or a non-receiving mode command.

[NACK] + [ERROR CODE]

(15h)

1(31): Parity error

3(33): Framing error

4(34): Over run error

(4) If an address other than the one for the deck or the group is designated during or prior to ACK and NACK transmission, then data being returned or held in the buffer are cleared.

(5) An ACK response is generated only to the last command received (prior to the ETX signal). When several commands (transmitted in sections, each separated by a semicolon ';') are sent simultaneously.

3) Panasonic protocol command list

Basic The leader shall be the group name for each function, then assign more detailed functions.

[0] Basic operation

OEJ	Eject Command
OSP	Stop Command
OFF	Fast Forward Command
ORW	Rewind Command
ORC	Record Command
OPA	Pause Command
OPL	Play Command
OPR	Play Reverse Command
ODN	Digital On (video memory) Command
ODF	Digital Off Command
OBN	Standby On Command
OBF	Standby Off Command
OSF:data	Shuttle Search Forward (CUE) Command and Data
OSR:data	Shuttle Reverse (REVIEW) Command and Data
	data : speed data 0-8 0=STILL
OPP	Play Pause Status
ORP	Record Pause Status

[E] Edit

EAD	Audio Dubbing Command
EAP	Audio Dubbing Pause Status

[I] In/output

IRR	Rehearsal Record Command
IRA	Rehearsal Audio Dubbing Command

[C] Counter

CRT	Counter Reset Command
CTL	Counter CTL Mode Set Command
CTC	Counter Timecode Set Command
CWT	Write only Timecode Command
CTP	TC Preset Mode Set Command
CTR	TC Regenerate Mode Set Command
CTF	TC Free Run Mode Set Command
CRR	TC Rec Run Mode Set Command
CUS:data	UB Preset Command and Data
CTS:data	TC Preset Command and Data
CDN	Drop Frame On Command
CDF	Drop Frame Off Command

[S] Search operations

SCP:data	Counter Search and Play Command and Data
SCS:data	Counter Search and Still Command and Data
SMC	Counter Search Mode Coarse(Search in FF and REW)
SMF	Counter Search Mode Fine(Search in shuttle search speed)

[R] Communication mode

RCR Condition Reset Command (Resets communication conditions)
RCK Online Check Command (Nothing is operating)
RGS:data Group Set Command and Data
RGC Group Cancel Command
RGR:data Group Leader Set Command and Data
(In effect only when the group is set)

[Q] Question

QOP Question Operation
example answer : play = OPL
QOS Question Operation Status
example answer : OPS0001684000
OPS+data(data is some status)
QCD Question Counter Data
example answer : fine and still search when TC mode = CDFS 9595929
CD+mode+data
(mode : fine/coarse, still/play
CTL data : sign + 9:59:59:29
LTC data : 23:59:59:29)
QCT Question TC Mode
example answer : free run and preset mode = CTFP
CT + mode (mode free/rec run, regenerate/preset)
QCB Question UB Generator Data
example answer : CUS01234567
CUS+data(data = UB7 UB6 UB5 UB4 UB3 UB2 UB1 UB0)
QCU Question Reading UB Data
example answer : CUR89ABCDEF
CUR+data(data = UB7 UB6 UB5 UB4 UB3 UB2 UB1 UB0)
QCS Question TC Generator Data
example answer : CTS23595929
CTS+data(data = 23:59:59:29)
QCF Question Drop Frame Mode
example answer : drop frame on = CDN
drop frame off = CDF
QRG Question Group Number
example answer : group 0A = RGS0A
RGS+address data
QID Question DECK ID
example answer : AG-IA232TC
QRV Question VTR Rom Version
example answer : V1.00 4/1/91
major.minor version and release date